

Flight, August 19, 1911.

FLIGHT

First Aero Weekly in the World.

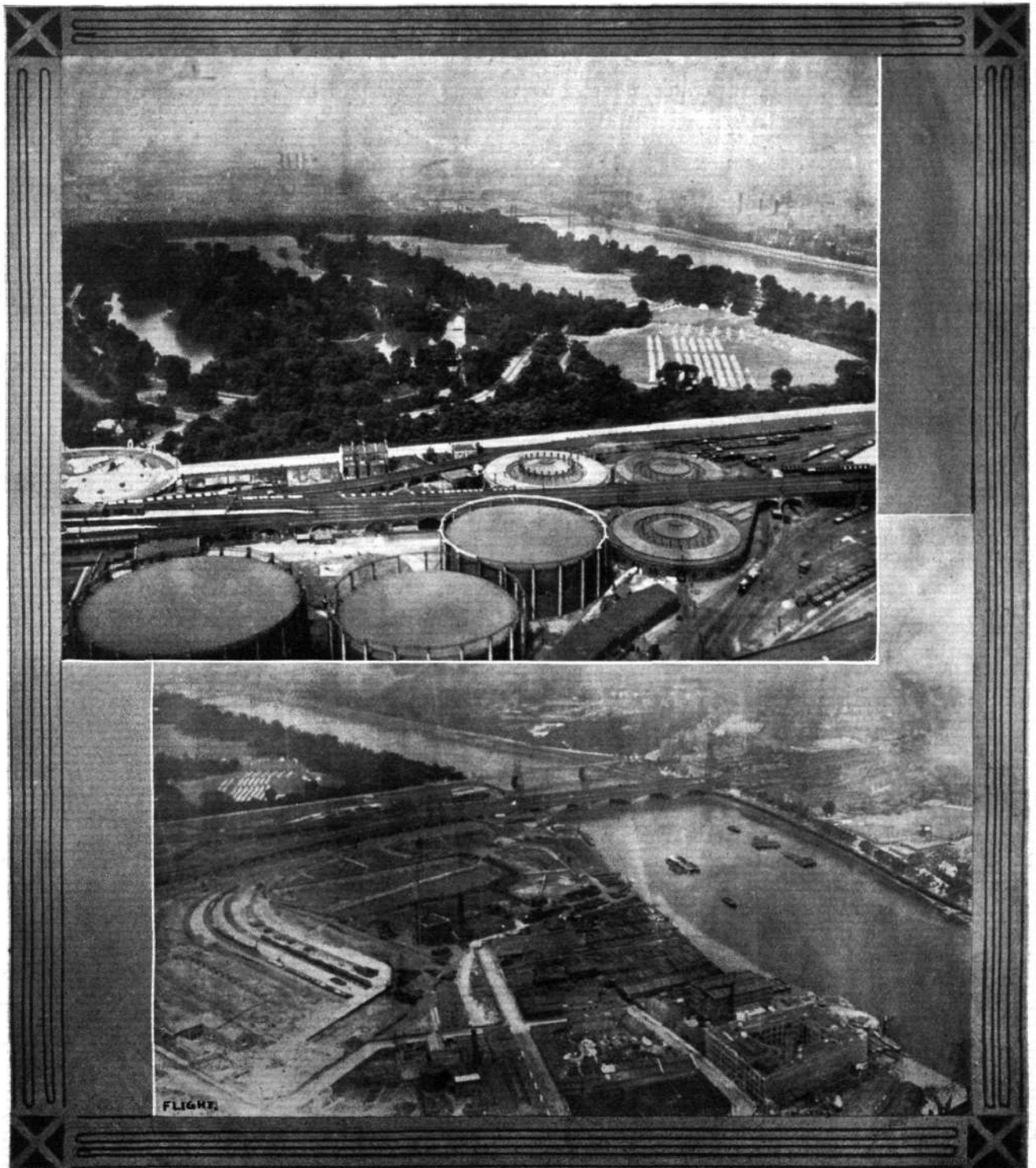
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PHOTOS BY CONSUL STOLLWERCK.
LONDON FROM ABOVE.—As seen from Consul Stollwerck's Continental balloon, "Hannover," on June 11th. Two striking views of (top) the Wandsworth Gas Works and Messrs. Short Bros.' balloon factory, with Battersea Park between the railway and the Thames, and below Chelsea Bridge.

A STUDY OF BIRD FLIGHT.

LAST week we commenced the publication of a series of articles on bird-flight, from the pen of Dr. Hankin, who, with the almost unexampled facilities for observation of the flight of large birds which India affords to the student, has devoted much time and patient study to the elucidation of the various problems bound up in the why and the wherefore of the flight of birds like the vulture, the cheel, the adjutant, and others of similar species. Measuring, as some of these immense birds do, as much as ten feet across the extended wings, it is manifestly a more easy matter to observe the details of their flight than it is in the case of such small fry of the air as we are accustomed to nearer home. Even so, if useful lessons are to be learnt it means that the faculty of observation and care in noting exact impressions must be developed in a very high degree, and it is because—as our readers will discover as the series proceeds—this habit of close observation and care stands out boldly in Dr. Hankin's writings, that we look upon the latter as being one of the most valuable studies of the subject in the literature of flight. Dr. Hankin has the great advantage of possessing the true scientific mind; without it, he could never have appreciated the importance of recording simple facts with faithful accuracy. In his articles he presents those facts with absolute impartiality, and the reader may draw his own conclusions therefrom just as he has done—and perhaps they will be diametrically opposed to his. This is the true test for the value of work done by an observer like Dr. Hankin. The author may or may not himself be the founder of new ideas to be accepted in the future; but it will be equally to his credit if someone else puts the coping stone of theory on his wall of fact.

As we have had nothing to do with its compilation, not even so much as to blue pencil a line, we feel no diffidence in commending Dr. Hankin's work to the serious attention of our readers. The reason it is in our opinion so valuable is, as we have explained, because it presents the complete facts before it gives voice to the author's conjecture. It is not everyone who is capable of compiling facts of this kind, and among those who are qualified few are willing to devote themselves to the task. Among the willing, there are, perhaps, only two or three who have the opportunity to do work that can stand the test of time. We believe that Dr. Hankin is a qualified observer; we know that he is a willing worker, and it is obvious from his records that he has had all the opportunity anyone could desire.

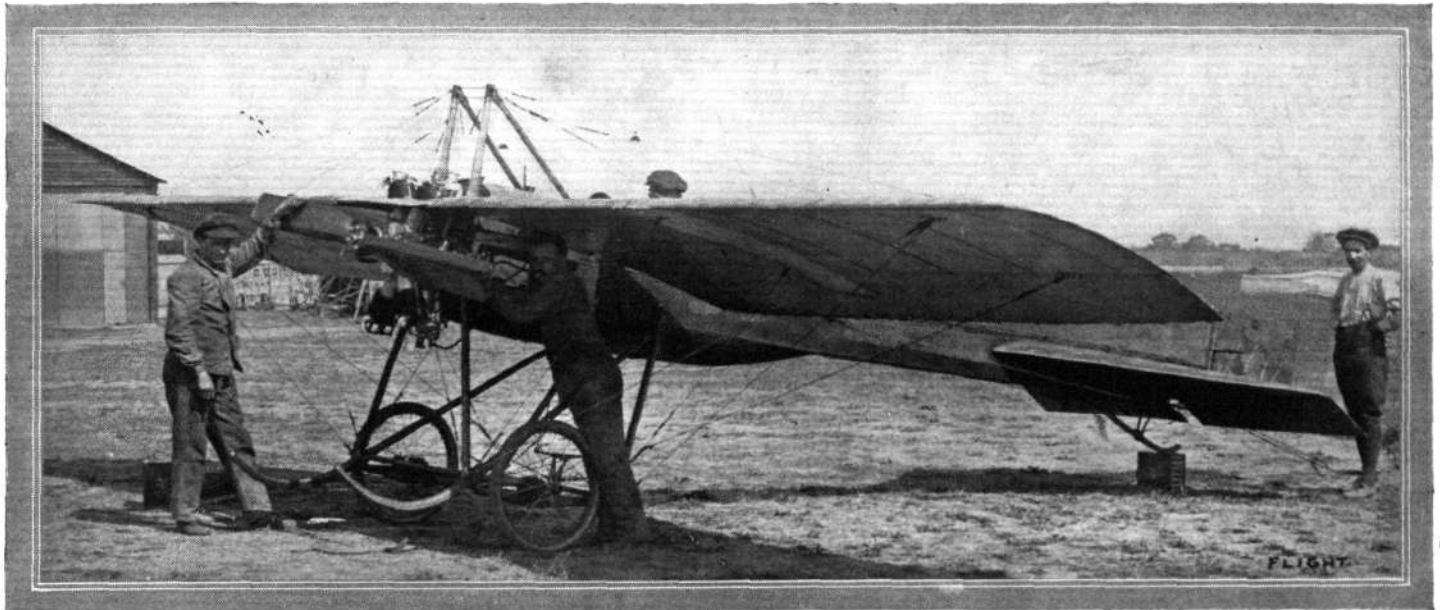
Moreover, he had the advantage of prosecuting the study of bird flight in the light, dim though it may be, of artificial flight. Lilienthal studied bird flight as the basis of aviation, we might almost say that Dr. Hankin has made aviation the basis of his study of bird flight. Too often the assumed behaviour of birds is turned to account in arguments favouring this or that type of machine, and there is no doubt whatever that all serious workers in the new locomotion have felt the want of a concise collection of facts wherewith to substantiate or refute such statements. So far as it is possible for anyone to provide information, Dr. Hankin has, so it seems to us, made an admirable attempt to do so. It is for this reason that we have been generous with our space towards those numerous "abstracts from my diary."

Perhaps the apparent repetition of similar items may be a little wearisome to the casual reader, and our only advice to those who peruse the articles in this spirit is to

"skip." Although it is difficult always to present stolid data in a readable form, we interpret our purpose in the conduct of FLIGHT to be to provide as far as possible serious information that can be relied upon when there is occasion to use it. If anyone disagrees with Dr. Hankin's deductions from the stated facts, let him by all means formulate his differences of opinion in clear cut words, and embody them in a letter for publication. The author desires his contributions to be discussed, which is one reason why they are published in FLIGHT.

Dr. Hankin is entitled to his point of view equally with others who are in possession of the same data. Those who argue on secondhand premises must, of course, ever be at some disadvantage compared with the status of an eye-witness in matters of mere opinion, but we know enough of our readers to feel sure that they will not hesitate on this account to lend the value of their own interpretations to Dr. Hankin's observations for the purpose of enhancing the merit of his contribution to knowledge. We spoke of Dr. Hankin's qualifications as an observer, and we would like to refer to one point of especial importance that will evolve as the chapters proceed. In addition to having the scientific mind necessary to the conduct of an investigation of this kind with impartial accuracy, Dr. Hankin is also possessed of the surgical skill and knowledge that has enabled him, immediately and at first hand, to confirm or disprove any supposed muscular movement on the part of a bird, by actual dissection and examination of its anatomy. No combination of accomplishments could well be of more service than those possessed by the author of "A Study of Bird Flight." For example, there were several occasions on which Dr. Hankin observed an apparent movement on the part of the bird's wing, which he scrupulously recorded in his ubiquitous note-book, exactly as it impressed itself upon his mind. In the ordinary course of things such a statement would have to go forward as an observation of fact, but Dr. Hankin's method of increasing the probability of his facts withstanding the test of time was to at once question whether the bird was indeed capable of performing the movement that he saw it apparently accomplished. And in some cases he discovered that there was no sort of muscle in the bird's wing that could have performed the requisite motion. Having thus convinced himself of the contradictoriness of "two facts," and having accepted the superior evidence, he proceeded to look again, and he kept on looking until chance gave him the opportunity of seeing exactly where his first observation was inaccurate. Still unconvinced, Dr. Hankin would patiently wait until other chances afforded confirmation, and only when at last he had brought physical and mental facts into accord did he feel entitled to build up some sort of a theory on the subject. As a case in point we will only mention an apparent bending of a bird's wing, which Dr. Hankin discovered by dissection must be a mere effect produced by an increased dipping of the leading edge, for which action alone the bird is provided with suitable muscles. We take this as one example of many, merely because it may interest some of our readers on account of its apparent connection with the peculiar formation of the wings in the Dunne monoplane, the designer of which, we have since learned, was led to this general conception of wing formation as the result of noticing in birds a similar action to that which Dr. Hankin has proved to take place.

THE DEPERDUSSIN MONOPLANE.



General view of the Deperdussin monoplane.

SINCE the first appearance of their product, which gave all those who were fortunate enough to be present at the last Salon Aeronautique in Paris an impression of neatness in design and workmanlike construction, the Maison Deperdussin has characterised its existence in the aviation industry by a commercial vigour that few have equalled and none exceeded.

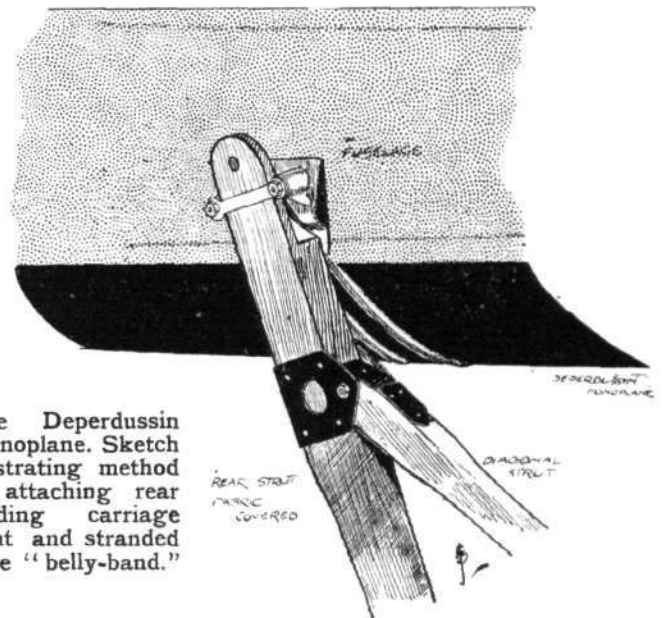
They first of all designed a good machine, and then employed good pilots to fly them. They established flying schools on the best aerodromes of France, Belgium and England, and lately have done their best to popularise their models by entering them in all the big competitions, and by putting them on the market at a very alluring price.

From the performances achieved by the Deperdussins in the Circuits of Europe and Britain, and from the fact that it was a "first reserve" in the Gordon-Bennett Race, may be judged their cross-country and speed qualities.

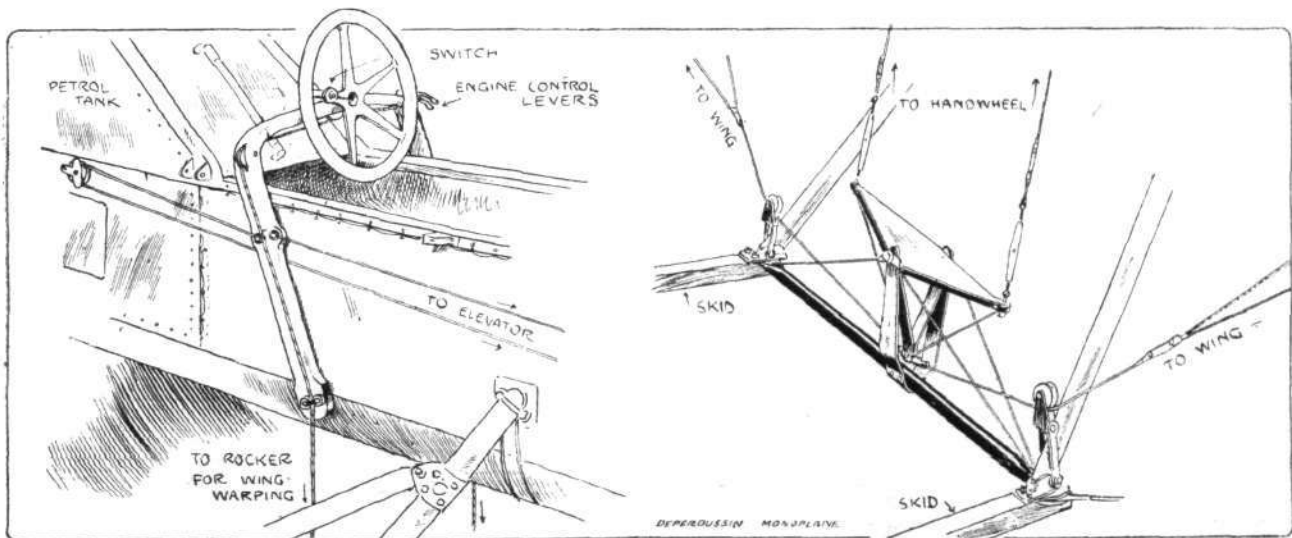
The fuselage under its fabric covering is of the ordinary box-girder type, but is peculiar in that the top and bottom longitudinals are parallel from engine to rudder, while to afford more accommodation for engine mounting, tanks, and pilot, a semi-cylindrical well is provided under the front section, consisting of a light wooden framework covered inside and outside with veneer.

The fuselage is pretty to the eye, but is so shallow that the pilot sits on it rather than in it.

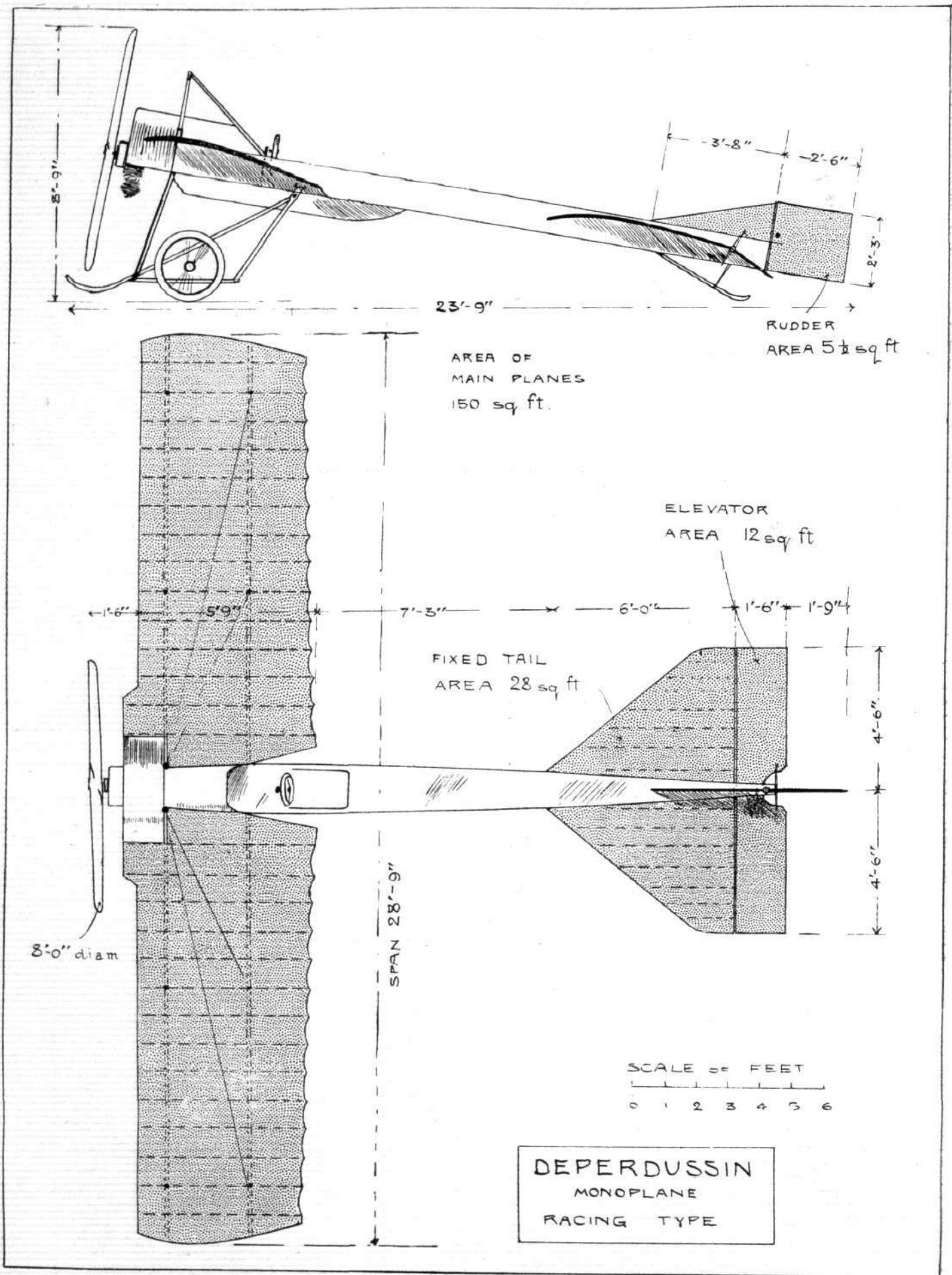
Another unique feature is the method of attaching the cross-bracing wires to the small aluminium sockets accommodating the struts.



The Deperdussin Monoplane. Sketch illustrating method of attaching rear landing carriage strut and stranded wire "belly-band."



THE DEPERDUSSIN MONOPLANE.—On left, details of control; the left wing is omitted for the sake of clearness. On right, warp-operating device fitted to rear tubular cross-member of chassis.



THE DEPERDUSSIN MONOPLANE.—Plan and elevation to scale.

The landing carriage is a neat and light wheel and skid combination, the axle being sprung by the conventional radius-rods and elastic shock-absorbers. The cross-members of the chassis are of steel tubing, and it is noticeable that the four main struts are covered with canvas. Very little wire bracing is used, but rigidity is given to the structure by two wooden diagonal struts in compression.

These struts extend in front of the chassis proper, and are curved up in hockey-stick fashion to form a protection for the propeller.

Shocks occasioned by rough landings are distributed over as much fuselage area as possible by means of stranded cables, which pass under the well of the body and over grooves at the top of the chassis-struts, thus forming a kind of cradle.

The method of mounting the motor is, without doubt, neat in the extreme. A sheet-steel cap fits over the front end of the fuselage, and to this is screwed in the usual manner that flat plate keyed to the Gnome crank-shaft which would form the fly-wheel if the cylinders were kept stationary. Aluminium inspection doors are provided for access to the magneto, &c., and an aluminium dome is arranged over the top of the motor, to prevent the spray of oil from the exhaust reaching the pilot.

The weight of the wings when the machine is at rest is supported by two struts erected vertically from the front of the main body in order, at the same time, to strengthen the wings against end stresses when in flight. They are of ample proportions near the base, as they also serve to accommodate the front wing spar.

The construction of the wings follows conventional lines, with the exception that the trailing edge is laced to the ribs and is allowed a small degree of flexibility. Aluminium plates are fastened on the under surface of the wings against the main body, to protect the fabric from becoming saturated with oil. Their brownish tint is due to the treatment of the fabric with "Emaillite," a preparation that renders it weather and oil proof, and endows it with exceptional tautness. This same varnish is also employed to proof the main frame covering and the tail planes.

The control is extremely neat, and the movements are more or

less natural. A wheel, mounted in the centre of an inverted U-shaped sweep of wood, is rotated for the correction of lateral balance, while a to-and-fro motion controls the elevation. Steering is effected by the usual form of pivoted foot-lever.

The wires from the warping-wheel are carried to a rock-lever on the rear cross-member of the chassis, and after passing over pulleys on the skids, each wire branches into three. These are connected to clips on the rear wing spar.

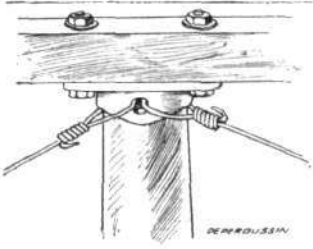
By rotating the wheel to the left, therefore, the whole of the rear spar of the right wing is pulled down, while the similar spar on the left wing rises a corresponding amount, and *vice versa*.

The combined oil and petrol tank is mounted in the front of the pilot between the two wooden masts, and gauges are fitted so that he is constantly acquainted with the state of his fuel supply. A small reserve petrol tank is arranged under the seat, and the fuel is fed under pressure to the main tank by a pump on the right of the pilot.

The passenger-carrying and school Deperdussin models have purely flat tail planes triangular in shape, but the racer, probably to render the machine more "lively" to the controls or to introduce greater internal strength, possesses a tail in which the upper surface is considerably cambered. This constitutes a lifting plane and contributes to a certain extent to the efficiency of the machine by actually doing work instead of being a solely directive organ.

Hinged to the rear of the tail plane is the rectangular elevator, while forward of the rudder extends a small vertical stabilising fin.

A neat skid, hinged in the centre and flexibly anchored at the top, protects the rear of the machine from ground contact.



Method of cross-bracing the main body adopted in the Deperdussin monoplane.



LONDON FROM ABOVE.—A remarkable photo of Kennington Oval and the approaches thereto, taken from Consul Stollwerck's Continental balloon, "Hannover."

A Study of Bird Flight

By Dr. E. H. Hankin, M.A. D.Sc.
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CHAPTER IV.—Graphic Records of the Track of Soaring Birds.

THE observations recorded in the preceding chapters suggest that soaring flight is not due to the bird being able to take advantage of chance currents of air. Any attempt to explain soaring flight on the basis of the description hitherto given would be premature. It is necessary, firstly, to consider in greater detail evidence bearing on the question whether or not wind is of importance for soaring. This I propose to do in a later chapter. Secondly, it is necessary to get more definite evidence as to what are the actual movements in soaring flight. For this purpose records of the track of soaring birds will be of help.

It occurred to me that if I watched the image of a circling bird in a looking-glass (with one eye closed) I could obtain a record of the track by following the image of the bird with a pen. Obviously, too, more information would be obtained if, instead of making a continuous line, the pen was used to make dots at regular intervals of time. To obtain the intervals I used a metronome set to tick either at half-second or 1 second intervals. For the pen I used a stylograph containing copying ink suitably diluted. After the record has been made a piece of paper is placed on the looking-glass and rubbed. Thereby a permanent copy of the record is obtained.

Fig. 1 is a looking-glass record of the track of a circling cheel marked at $\frac{1}{2}$ second intervals. At the time this record was made the wind was very light, scarcely enough to move leaves. Hence the bird shows but little leeward drift, and the successive circles overlap closely. The time marks may be seen to be closer together on the windward side than they are on the leeward side of each circle. This means that the bird was travelling more slowly on the windward side of the track. There can be little doubt that this loss of speed is connected with gain of height, which, as already explained, usually occurs on the windward side of the circle. In this illustration, as in succeeding ones, the large arrow indicates the direction of the wind. The small arrow shows the direction of flight of the bird.

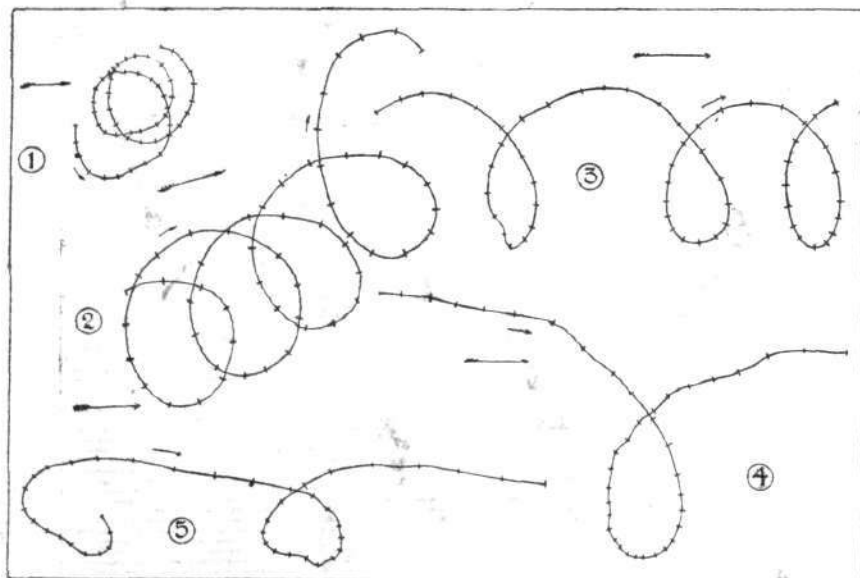


Fig. 1.—January 8th, 1911. Jharna Nullah. Track of cheel circling marked at $\frac{1}{2}$ -second intervals. Note lessened speed on windward side of track. Fig. 2.—Track of cheel circling. Fig. 3.—Track of cheel circling in light wind. Fig. 4.—January 10th.—Jharna Nullah. Vulture leeward looping in a strong wind. Fig. 5.—January 8th, 1911. Jharna Nullah. Scavenger leeward-looping. This was the first scavenger seen up. Cloud was getting thinner, and soarability was increasing. Previously cheels only had been circling. Note diminution of speed all round the loop. Track marked at $\frac{1}{2}$ -second intervals.

More usually the circles overlap by a greater distance, as shown in Fig. 2. In this case there is very little difference between the speeds shown on the leeward and windward sides of the circle. It is probable that it is a case of "ease-circling," that is to say, circling without attempt to gain height. The wind was very light, just enough to move leaves, when this record was taken.

In the presence of a certain amount of wind the circles may overlap by a greater distance, as shown in Fig. 3. In certain cases, especially in the presence of a strong wind, the intervals between the loops may be still greater. I propose the term "leeward looping" to describe this latter form of flight. As shown in Fig. 4, the diminution of speed indicating gain of height may occur chiefly at the point marked A, that is to say, when the bird has turned round to face the wind. In some cases in leeward looping, when observed at some distance from the side, there appears at this point to be a vertical gain of height of as much as 1 or 2 metres. In some cases in leeward looping the bird appears to gain height during the whole of the loop. That is to say, it gains height not only while facing the wind, but also when going with the wind—in short, during the whole time that it is on a curved course. Such a case is illustrated in Fig. 5.

It might be thought that the difference between circling and leeward looping depends merely on the presence or absence of wind. I doubt whether this is the case. For instance, the case of leeward looping illustrated in Fig. 5 was recorded in a light wind just strong enough to move leaves. I have on one occasion seen circling with scarcely perceptible drift to leeward in a strong, stormy wind. There can be no doubt that the amount of leeward drift in circling differs at different times, owing to factors not yet understood. I may quote the following diary extracts bearing on this matter:—

July 14th, 1910. At 6.46 two cheels seen circling together. One changed its movement from circling to leeward looping. Shortly afterwards the other made a similar change. A minute later both birds glided down and settled. Widespread soaring began at 7.14.

September 29th, 1910. At 3.35 an east wind, somewhat strong, moving branches. Sunshine. Isolated small cumulus clouds. Scanty clouds of higher layer. Four vultures seen circling in and out of the base of a small cumulus cloud at a height of 1,100 metres. Their leeward drift was not so much as that of the cloud. In a few minutes they were circling nearly overhead, and the cloud was far away to leeward. I made no record of the size of this cloud, but my recollection is that it was not larger in any dimension than eight or ten times the span of a vulture. Cheels and vultures were circling and flex-gliding to windward. They were leeward looping when going to leeward.

Referring to Fig. 5, it will be noticed that there is a somewhat sudden increase of speed immediately after the loop and at the commencement of the leeward glide. I have been able to observe the adjustment of the wings used to initiate this increase of speed, and shall describe it in a later chapter. The length of the leeward glide may, in some cases, amount to 100 metres or more.

CHAPTER V.—Flex-gliding.

On first beginning the study of soaring flight, I was puzzled by the apparently large number of species of birds that were to be seen. In particular there was a large vulture the under side of whose wings appeared white or yellow in front, and black along the posterior margin. It carried its wings advanced so that the wing-tips were on a level with the beak. Another bird had the same colouring,

but carried the anterior margin of its wings in a perfectly straight line with one another. Yet a third species was similar in colouring but had the wings somewhat flexed with the wing-tip feathers pointing outwards and backwards. It was only after some acquaintance with the subject that I discovered that these different birds were all of one species, namely, the common large vulture, but with their wings in different positions according to the kind of flight in which they were indulging.

If a circling vulture is watched its wings will be seen to be in the dihedrally up position. The amount of the dihedral angle varies under different circumstances as will be described in a later chapter. The wings also are fully extended, and if the air is fully soarable they are somewhat advanced, so that their tips lie on a level with the beak. Sooner or later a change in the mode of flight will be noticed. The bird is no longer canted over, as is always the case in circling, but is seen to be gliding in a straight line and on a level keel. While thus gliding the wings are no longer fully extended

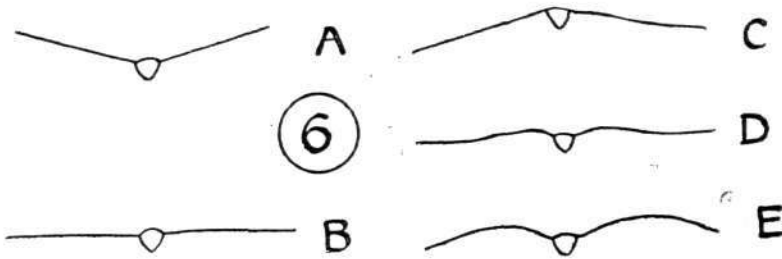


Fig. 6.—Diagrammatic end-on view of birds with wings in different positions. A, wings dihedrally up. B, wings flat. C, wings dihedrally down. D, appearance presented by cheels when flex-gliding. E, wings arched.

but are more or less flexed. For this reason I propose the term "flex-gliding" for this form of flight. The speed can be seen to be greater than it is in circling, and the more the wing is flexed, that is to say, the more the span of the bird is diminished the greater is the speed. In Fig. 7 is shown the outline of a cheel when circling. In this bird, advancing of the wings when circling is not well marked. In Fig. 8 the cheel is shown with wings slightly flexed as seen in flex-gliding at low speed. In Fig. 9 the outline is shown with wings strongly flexed as occurs in fast flex-gliding. When seen from behind and from a distance the flex-gliding cheel has the appearance shown in Fig. 6 D. That is to say the inner portion of the wing appears to be curved upwards. For a long time the meaning of this appearance was unknown to me. In a later chapter I hope to describe the fortunate chance that led me to discover the meaning and nature of this adjustment.

In flex-gliding there is no dihedrally-up angle; the wings are perfectly flat, but as will be shown later the centre of gravity is still at a lower level than the centre of lifting effort of the wings.

In attempting to discover the source of energy of soaring flight it obviously is desirable that measurements should be made both of the height at which birds soar, that is to say of the height they may

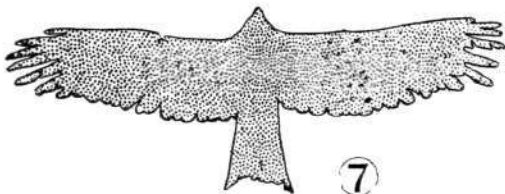


Fig. 7.—Outline of a cheel when circling.

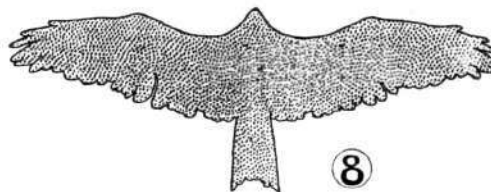


Fig. 8.—Outline of a cheel when slow flex-gliding.



Fig. 9.—Outline of a cheel when fast flex-gliding.

obtain without flapping, and also of the speed at which they travel.

To measure the height of soaring birds I have made use of the "Souchier telemetre." This instrument is a binocular field glass with an arrangement by means of which a crystal of Iceland spar can be placed over each eyepiece. When the Iceland spar is in position the image of the object looked at is seen double. The further away the object the further apart do the two images appear. Hence, if the size of the object is known an estimate can be made of its distance. In my instrument the overlap of the two images for 100 metres is five inches. If the object is 200 metres away the overlap is ten inches. For instance, if on looking at a bird whose wings are known to me to be ten inches wide, the images of the wings are seen to be just clear of one another the distance of the bird is at once

known to be 200 metres. Nearly every specimen of the common vulture I have shot was found to be of 84 or 85 inches span. Supposing a vulture at a height is looked at with the telemetre. If the two images exactly overlap so that the wing-tip of one image touches the wing tip of the other image, then since $85 = 17 \times 5$, the distance of the bird must be 1,700 metres. I have on one or two occasions seen vultures circling at this immense height.

I have made what I believe to be a new application of the telemetre, namely in using it to measure the speed of gliding flight. I found by measurement that at a hundred metres distance the width of its field of view is six metres. At 200 metres the width of the field of view was found to be 12 metres, at 300 metres it was found to be 18 metres, and so on. Consequently the speed of the bird can be estimated by measuring, with a stop-watch, the time of its passage across the field of view. For instance, suppose the distance of a flex-gliding vulture has been found to be 600 metres. Its time for crossing the field of view when the telemetre is held steady is found to be two seconds. Then the width of the field of view at 600 metres distance is known to be 6×6 , that is to say 36 metres. Therefore the bird travels 36 metres in two seconds. Therefore its speed is 18 metres per second.

I propose to give a somewhat lengthy series of extracts from my diary giving examples of measurements of speeds by this method. There is a prevalent opinion that soaring consists in the bird being able to take advantage of chance currents of air. The speeds of soaring flight actually measured give scant support to this view. In the early morning before soarability is fully established, flex-gliding takes place with loss of height. But a few minutes later the direction of flex-gliding may be seen to be apparently horizontal. It seems scarcely likely that there is any loss of height that can account for speeds of 20 metres per second, which may be continued over distances of several miles. Such facts suggest that the soaring bird has at its disposal some source of energy whose nature does not seem to be suspected. The speeds actually given for flex-gliding show an apparent variation. The disposition of the wings corresponding to each different speed will be described on a later occasion. The measurements of speeds of circling were carried out before I had in my possession the graphic method of recording the track. At the time of making these observations I had with some difficulty been able to observe a loss of speed on the up-wind side of the track. On referring to the previously given illustrations it will be apparent that greater contrasts in speed would have been obtained if I had measured the speeds on the windward and leeward sides rather than those on the up-wind and down-wind sides of the track. The following are the extracts:—

January 19th, 1910.—At 4.0.—A vulture seen flex-gliding to leeward, 300 metres up at 9 metres per second.

January 21st, 1910.—At 3.45.—A vulture circling. On the up-wind side at 5 metres per second. On the down-wind side at 9 metres per second.

January 24th, 1910.—At 10.45.—Vulture circling. Speed, down-wind side 12 and 12 metres per second. On up-wind side $8\frac{1}{2}$ and 7 metres per second.

February 3rd, 1910.—At 3.40.—Black vulture flex-gliding up wind at 500 metres height at 15 metres per second. Another black vulture at same height flex-gliding with wind on beam at

20 metres per second. Vulture at 400 metres height flex-gliding up wind at 8 metres per second. Cheel at 800 metres beam on flex-gliding at 12 metres per second.

4.0.—Vulture at 200 metres height circling. Speed up-wind 3 metres, and down-wind at 12 metres per second. Vulture at 500 metres flex-gliding down-wind at 20 metres per second.

February 9th, 1910.—At 4.35.—A vulture circling at 100 metres up exactly overhead. Its speed on up-wind side was 6 metres and on down-wind side 12 metres per second. A vulture at 250 metres height flex-gliding up-wind at 21 metres per second.

February 14th, 1910.—At 3.52.—Black vulture seen flex-gliding up-wind at 700 metres height at 20 metres per second.

At 3.54.—A vulture seen at 1,700 metres height flex-gliding. It was visible only for a second or two by the naked eye.

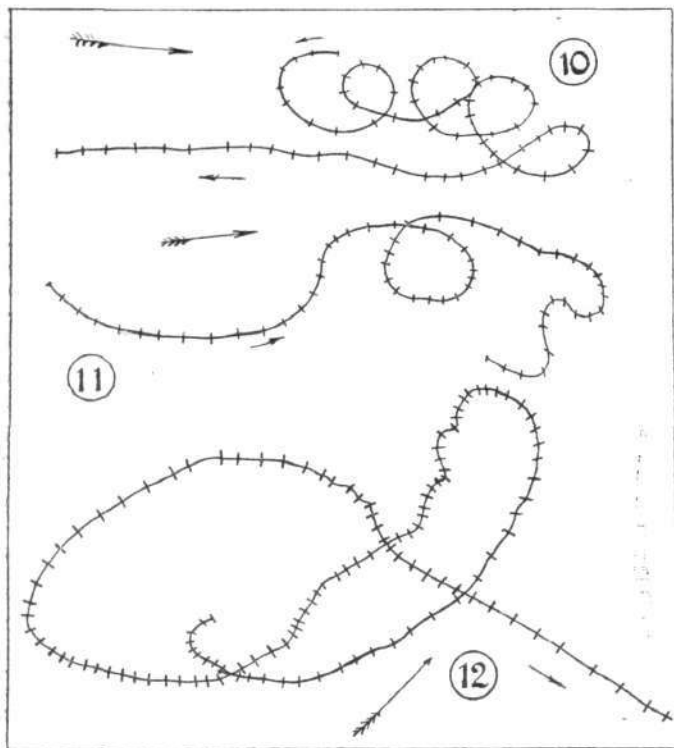


Fig. 10.—January 8th, 1911. Jharna Nullah. Cheel circling and then flex-gliding up wind at slow rate. At the time there was thin cloud, and no fast flex-gliding had occurred. A few minutes later, as cloud got thinner, fast flex-gliding of cheels began. Track marked at 1-second intervals. Wind at the time not strong enough to move leaves. Fig. 11.—January 8th, 1911. Jharna Nullah. Cheel ease-gliding and making one circle. Track marked at $\frac{1}{2}$ -second intervals. Fig. 12.—January 10th. Jharna Nullah. Vulture ease-gliding, and then flex-gliding in a strong wind.

At 4.0.—Cheel at 1,200 metres height flex-gliding up-wind at 9 and 10 metres per second.

February 19th, 1910.—At 9.46.—A vulture flap-gliding up-wind at 18 metres per second. At 9.47.—This vulture was circling. Speed on up-wind side 7 metres, on down-wind side 12 metres.

February 20th, 1910.—At 10.7.—Four vultures seen circling at 400 metres height. At 10.10.—They were found to be circling at 8 metres per second both on the up-wind and down-wind sides of the circle. That is to say supposing the wind was west. But smoke from the Cantonment Railway Station appeared to be rising vertically. Leaves were quite still. Two measurements taken, after which the vultures flex-glided to north out of sight.

At 10.21.—A vulture observed at 800 metres height. It was circling at 12 metres per second both on up-wind and down-wind sides of track on the supposition that the wind was north or south. After two measurements had been made it flex-glided to north at 16 metres per second. Shortly afterwards a light draught of air came from the east, that is to say, the direction of the wind was doubtful at the time of the observations. Leaves were still and smoke was ascending vertically.

March 3rd, 1910.—At 11.30.—A strong north-west wind. Vultures circling on down-wind side showed speeds of 24, 21, 27, and 27 metres per second. On the up-wind side speeds were measured of 7, $7\frac{1}{2}$, 9, 9 and 9 metres per second. (The wide difference of speeds measured on up- and down-wind sides must have been due to the unusually strong wind.)

October 11th, 1910.—At 4.35.—Vultures circling at 1,200 metres. Wind west, leaves still.

November 12th, 1910.—At 3.33.—A vulture seen fast flex-gliding in and out of the base of a cumulus cloud at 1,700 metres height.

Flex-gliding can take place in any direction relative to the wind. I have, however, only observed flex-gliding direct to leeward in very light and in irregular puffy winds. In a strong and steady wind birds usually go to leeward by leeward-looping.

(To be continued.)



A New Spanish Military School.

THE Spanish military authorities have decided to establish a flying school close to Carabauchel. Louis Dufour has been appointed instructor, and the pupils include three captains and two lieutenants.



Mdlle. Marvingt, the winner of the Coupe Femina for lady aviators, who last week, owing to motor trouble, descended in a skittle-alley whilst flying near St. Etienne, is not only a flyer of distinction, but is an all-round sportswoman. Skiing is amongst her favourite pastimes, and above she is seen in the centre at Chamonix during the enjoyment of this exhilarating sport.

USES OF THE AEROPLANE IN AUSTRALIA.

BY SYDNEY E. SMITH.

(From the *Pastoralist's Review*.)

So far Australia has taken no share in the practical solution of the problem of flight, and the only machine to be flown across country here satisfactorily and carrying passengers is the Bristol biplane, which has been demonstrating in Melbourne, Sydney, and Perth (W.A.) Now that reliable machines are immediately available it remains for Australia to take her share in the evolution of flying by providing the first real work to which the aeroplane of to-day may be put and in which it would prove itself invaluable and a profitable investment. This work is to be found on the large sheep and cattle stations of Australia. The present means of communication from the nearest railway is by roads, which under the best conditions are frequently in bad order, and after rain quite impassable. Nearly every one of the large stations are in themselves superior to the finest aerodromes of Europe, and provide the safest possible ground over which to fly, the plane surface of the ground ensuring a minimum of gustiness of the wind.

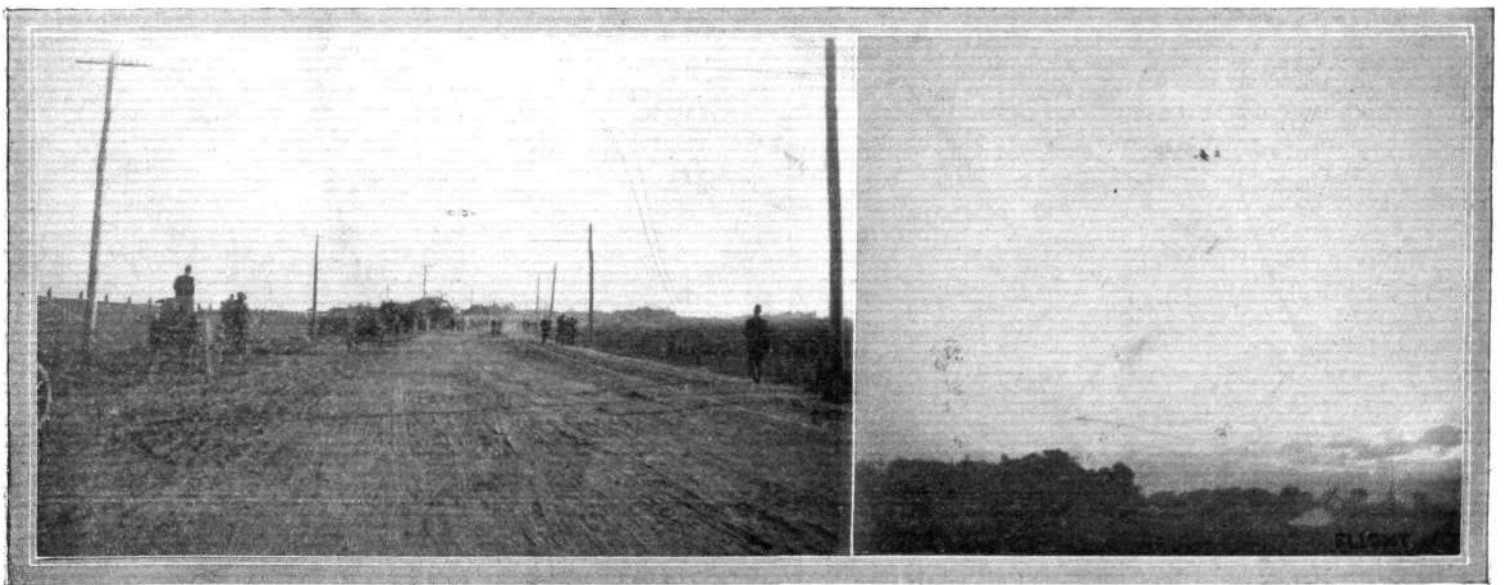
On the station the uses of the biplane would be many, in particular for carrying the pastoralist on a tour of his outstations, for inspecting the fencing while flying about 20 ft. from the ground, for locating cattle or sheep at great distances, and for conveying the mails from the nearest township expeditiously. For station use the standard type Bristol biplane is recommended, as although the aeroplanes and racing biplanes built by the same manufacturers and others are speedier machines, the chief requirements are reliability, ease of repair, capacity for one or two passengers besides the pilot, or their equivalent in load, and facility of inspection of the ground from the machine. The speed of the standard Bristol biplane is 40 to 45 miles per hour, and it can safely be flown in steady winds up to 30 miles per hour, or in gusty winds of from 10 to 15 miles per hour. The weight of the machine is 700 lbs., and the shed required for its shelter should be 40 ft. wide by 45 ft. long, and the clearance in height should be 13 ft. Such a shed in timber and galvanised iron need not cost more than £100. The cost of a Bristol biplane, fitted with 50-h.p. Gnome engine (a reproduction of the machine demonstrated throughout Australia) is £1,000, delivered f.o.b. Bristol; freight, about £50; duty, about £330; carriage to station, say, £30—making, with some spare parts, a total cost of about £1,500, delivered upon the station up-country. The running costs are small, as the petrol and lubricating oil consumed only amount to about 3 gallons and 1½ gallons per hour of flight, or 40 miles distance, respectively. It is difficult to estimate at present the life of a machine, but the first biplane built by a well-known firm four years ago is still flying daily on Salisbury Plain, fitted with the first Gnome engine built, and this machine, though

slow and somewhat out of date in appearance, has had very little repair during its life. The Bristol biplane which has been flying so successfully in Australia was built in July, 1910, and since that date has been in constant use. It was used by Captain Dickson in the last English Army manoeuvres, by Mr. Robert Loraine in wireless telegraphy experiments, and by many other well-known aviators, as well as having been used as a school practice machine in England. Since its arrival in Australia, where it has been flown by Mr. Hammond and Mr. Macdonald, it has flown 765 miles in seventy-two separate flights, thirty-two of which have been with passengers. During the whole of these flights not one pennyworth of damage has occurred to the machine in connection with any start, flight, or landing, and the machine is now in perfect order. These facts speak for themselves as to reliability, upkeep, and usefulness, and prove that the editor was by no means drawing unduly upon his imagination when he prophesied in the March issue of this "Review" that aeroplanes would shortly be considered more necessary on an up-to-date station than a motor car. It is true that with a properly cautious pilot the conditions of wind often make the use of the machine impossible or risky, but squatters will recollect that few days pass without some hours of suitable weather, while in winter in some parts of the country, scarcely a breath of wind is felt for weeks together. It must also be borne in mind that an aeroplane can cover a distance in one hour which would take a day's riding in the saddle, thus saving many hours for other purposes, or enabling great distances to be covered during the day.

The difficulty in the minds of many may be that of learning to fly. It is the purpose of the British and Colonial Aeroplane Company to arrange shortly for purchasers of machines to be taught to fly them free of cost at a central school in Australia or on purchasers' own machines on their stations. The period of learning, given fairly favourable weather conditions, and an average intellect of the pupil, should not exceed three weeks. The machine and engine should be well looked after by an ordinary chauffeur, and in case the owner is not desirous of flying his own machine, he can get all the uses of the machine by having a man trained and himself riding as passenger.

The terms of appreciation in which General Gordon and Colonel Antill, C.B., of the Commonwealth Forces, have spoken of their flights at Sydney, and the fact that the Russian Army has ordered eight and the British Army four* Bristols, should remove any doubt as to their effectiveness for military purposes, and what the pastoralist requires no less than the soldier is the best and quickest means of communication and observation.

* These have been increased since.



FLIGHT IN AUSTRALIA.—From New South Wales, Mr. A. H. Wakeford sends us the above interesting photographs of Mr. J. Hammond flying on his Bristol biplane at Ascot, Sydney, on May 5th last. On the left Hammond is crossing the main road during a trial spin, and on the right he is finishing the day with a high flight as the sun is setting.

More Encouragement by French Government.

THE Aero Club of France has received from the Minister of Public Works a sum of £20,000, being part of the credit voted by

the French Parliament for the encouragement of aerial navigation. This money will be spent in connection with the preparation of the series of maps for aviators and aeronauts which the Club has in hand.

FROM THE BRITISH FLYING GROUNDS.

Royal Aero Club Flying Ground, Eastchurch.

BEARING in mind the weather of the past week, which, although fine, has been far from good flying weather, owing to the excessive heat and the gusty breezes, there has been considerable activity in the Aviation Camp here, for the most part in the early morning.

Lieut. Samson was out on one of the Short Naval machines at 6 a.m. on Tuesday making a tour of the island, with every inch of which he is now probably thoroughly conversant. After a very prolonged flight he concluded with an excellent *vol plané*. Mr. Travers, meanwhile, had ascended, also on a Short biplane, and he gave quite a good exhibition during the time he was in the air. In the evening the Naval Officers were busy, Lieuts. Samson and Longmore each making long flights across country.

On Wednesday the villagers were awakened at 5 a.m. by the hum of a Gnome engine overhead, and all who turned out recognised one of the Short machines, which was then heading away towards the sea. This we subsequently ascertained was the Hon. Maurice Egerton, who, after making practically a tour of the island, headed for the open sea. After flying for quite a considerable distance out over the North Sea he returned home, landing skilfully outside his shed just before 7 a.m. Before Mr. Egerton was out of sight, another machine was seen approaching the village from the direction of Leysdown, whilst yet another was travelling high up and in the direction of Queenborough. These turned out to be respectively Mr. Travers and Lieut. Samson. The former made a wide detour of the village, and then went off in the direction of Elmley, whilst Lieut. Samson skirted Queenborough, and then returned over Elmley, Teynham (on the mainland), Hartly and Leysdown. Shortly after this, Lieut. Longmore set out with a passenger, whom he took for a long cross-country flight. The four Naval Officers were again out in the evening, between 6 and 8.30 p.m. Mr. Alec Ogilvie was also out for quite a long flight on the "Baby" Wright, making repeated circuits between Leysdown and the aerodrome.

On Thursday Lieut. Samson was out before 6 a.m. and put up nearly two hours' flying before breakfast; Mr. Travers was also out getting some early practice. On Friday Lieuts. Samson and Gregory were at work before 6 a.m. and again in the evening. Lieuts. Samson and Gregory, and also Mr. Travers, were flying about 5.30 a.m. on Saturday, and were fortunate to get in a number of good practice flights before breakfast, for shortly afterwards the wind rose considerably, and in conjunction with the heat which prevailed throughout the day made the atmosphere very tricky.

On Sunday morning Mr. Travers was out at 5.30 for a flight of just over an hour, and was flying extremely well. On Monday evening the Naval officers got in their customary practice, despite a stiffish breeze.



M. Pequet and the Humber monoplane he flies at Brooklands.



M. Pequet in practice flight at Brooklands on the Humber monoplane.

Brooklands Aerodrome.

ON Wednesday evening last week the wind dropped considerably and a good deal of flying was indulged in. Johnson was out on the Howard Wright with the E.N.V. pulling well, and he ascended very quickly to about 600 feet and then came down in a series of *vol planés* which put the onlookers' hearts into their mouths. We thought something had gone wrong. However, he explained to us that "it felt awfully nice." It is rumoured that he is going to join Vickers' staff in connection with the R.E.P. De Montalent was also out on the Breguet making trips before some of the Army officials. He always runs down the field for a start, it has evidently become a habit since the *Daily Mail* circuit. His machine flies very strongly, and for a biplane glides very well. The Flanders was out with the versatile and picturesque Fisher on board. He made straight flights and then tried a turn, made several good circuits, but found that once turned to the right there was a distinct tendency to keep on going round. This was explained, on examination, by the fact that the canvas-shrinking varnish put on was too strong, and had twisted the planes. This is being rectified, and we hope to see something good from this machine. Fisher has joined Vickers as pilot to the R.E.P. This machine is, according to Watkins, "an absolute 'bus,'" so some good flying in the near future is being looked forward to. Pixton was flying on the Bristol just outside the track when the engine took a rest, so he had to land on a very awkward place between a railway embankment, a river, and some cows. He managed it successfully, and after tinkering the engine he rose, banking heavily to get between some trees—at least, that's what we heard. The Avro-Farman was out teaching pupils, carrying them bravely despite its decrepit condition. Spencer was making some circuits, and Pequet, on the Humber monoplane, was around outside the railway, ending with a *vol plané*.

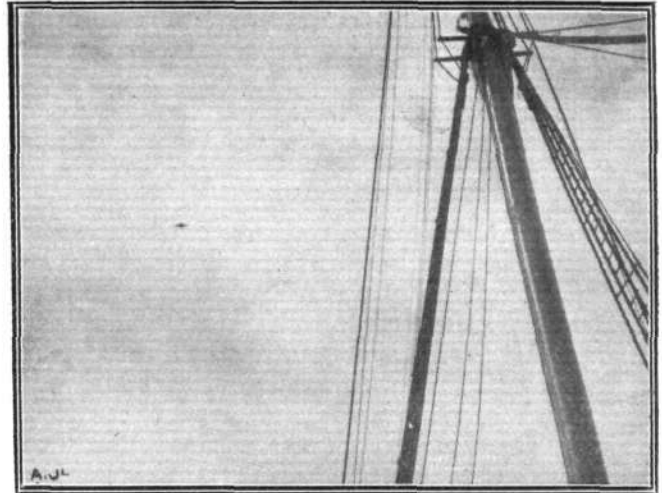
Thursday was windy all day, and although Friday was also we had an interesting demonstration of the use of the aeroplane in naval warfare. Early in the afternoon several strangely garbed sailors were noticed taking down the shutter of one of the sheds, a cinematograph camera was placed in position, and at the word of command of a very dapper officer of apparently four different ranks, the sailors grasped the machine, which was of the Blériot type, and rushed it out. Scene II: Excitement grew intense as the machine

was propped up on three empty beer crates to give it the appearance of flying, the dapper officer climbed in, holding in his hand an instrument shaped like a Cupid's dart, which we afterwards learnt was a bomb. The camera clicked and the machine rocked violently owing to the strenuous efforts of a mechanic at the wing tip. Despite the fact that the machine was having a ghastly time with "remous" and wind gusts, the pilot fearlessly stands upright in his seat, then, regardless of the controls, grasping Cupid's dart in both hands he leant over the side and hurled it below, presumably to the utter destruction of the enemy's fleets (or was it a new method of dealing with the strike riots?). So no doubt early twentieth century history has once more been recorded for the benefit of the present and future generations.

Saturday was windy and nothing of any note happened. Pupils were busy in the morning early, as also on Sunday. Late in the evening Pixton went out and took a passenger, then one of Blondeau's pupils gave a very excellent exhibition for a beginner. Maurice Ducrocq was again busy with his Farman, making several early morning flights. He is booked to give an exhibition flight at Workington—up North. On his return he intends flying the Nieuport he has down here, the only flying on it having been done so far by Chevalier. On Monday morning De Montalant and a passenger started off in fine style for Paris, but we have since heard that he came down at or near Dorking, and tried to perch on a telegraph pole, damaging the machine pretty considerably. In the evening Pixton flew for a few circuits on a Bristol and the Billing biplane, locally known as the "Ouseley Bird," with Percival up, meandered round, and touched at the sewage farm for a rest. Snowden-Smith could not get his engine to run so did not ascend. The A.B.C. engine was brought out and run, it has a very healthy look, and a good deal of power, it is also a very nice clean-looking engine, and should be a good thing when tuned up thoroughly. Valentine's machine is being got ready for a flight to Ventnor, Isle of Wight, via Shoreham. He hopes to start on Tuesday morning. England left, via Salisbury, on Sunday morning.

Liverpool Aviation School, Sandheys Avenue, Waterloo.

The school machine, after being hung up for nearly a month through a cracked crank-chamber and scored cylinder, was out again on August 1st, Mr. Jones piloting; he made a steady circular flight about a mile in diameter. Unfortunately, after landing, he turned on the ground somewhat abruptly, damaging his left wing. On the 2nd, he was again up, making several short flights. No further flying took place till the 8th, when Mr. Jones again flew a complete circle, but had the misfortune to break a wheel and propeller in landing too steeply. On the 12th Mr. Jones was flying early, and made several short trips in a very tricky wind, which decided him to suspend further operations.



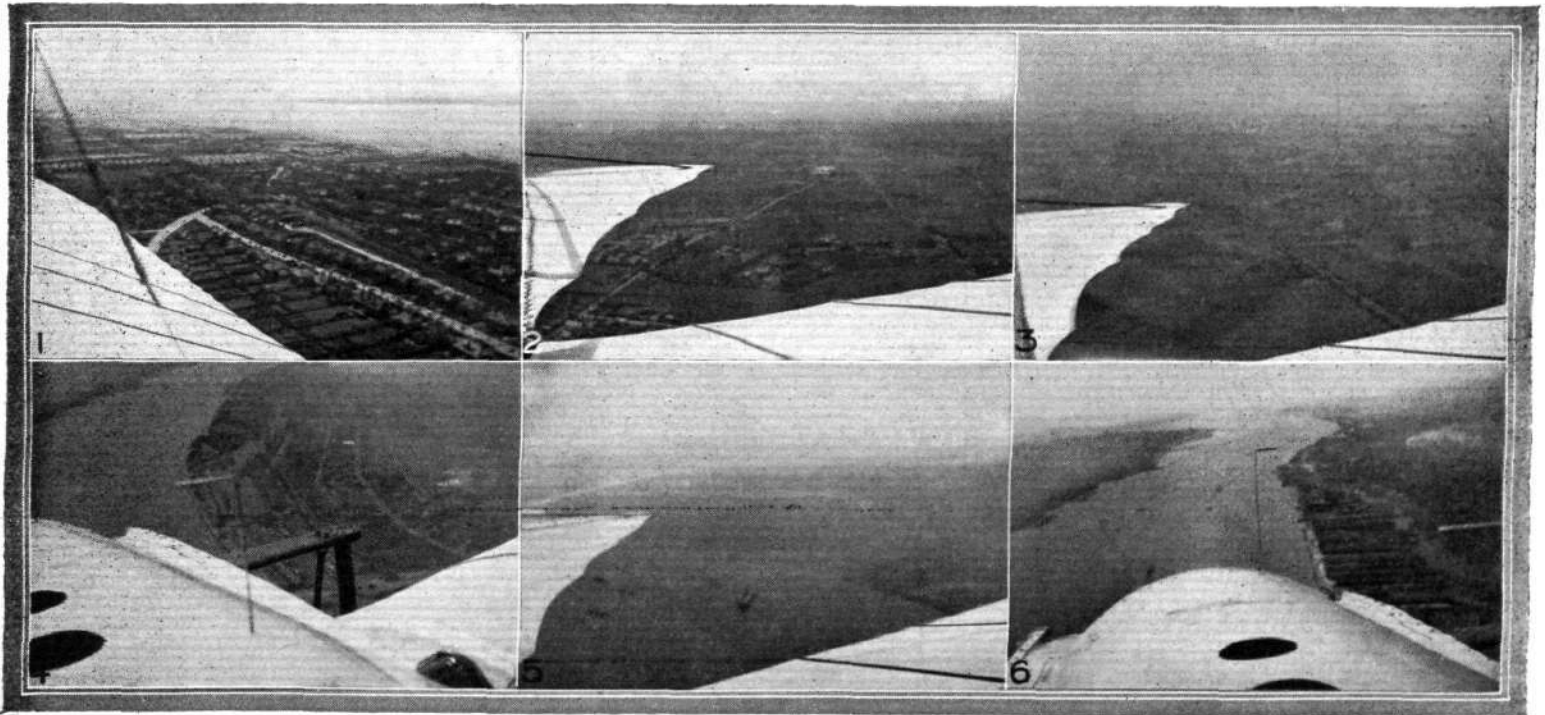
Mr. H. G. Melly on his two-seater Blériot, as seen from the s.s. "Victorian" lying in the Mersey. This photograph, by Mr. Alex Reid, gives an excellent idea of the height and position of the machine over the Mersey.

The two-seater which has been under repair since the accident at Manchester Aerodrome is now completely repaired, and only awaits the erection of wings.

London Aerodrome, Collindale Avenue, Hendon.

Blériot School.—Besides Mr. Barber, the famous Valkyrie pilot, Mr. Hamel, on Bank Holiday, on the two-seater Blériot, took up several other passengers, including Miss Russel, Miss Parbury, and Mr. Conway Monk.

On Tuesday Mr. Hamilton, who, by the way, is ready for his *brevet*, made several good circuits of the aerodrome at a height of about 150 ft., whilst Mr. Slack made some straight flights. In the afternoon Mr. Hamel climbed for altitude on his 50-h.p. Blériot and reached 2,000 metres, he also afterwards carrying as passengers Messrs. Goode and Middleton. Wednesday morning was very misty, but cleared up about 5 a.m., when Mr. Hamilton made some right-hand turns, and Mr. Abercromby carried out a few flights. The wind then getting up stopped work for the day. Thursday was a blank day owing to the wind, and on Friday Mr. Hamilton flew a few times round the aerodrome, Mr. Abercromby making a few straight flights.



Liverpool, Manchester and the Mersey, seen from Mr. H. G. Melly's two-seater Blériot, as snapped by his passenger. 1. Leaving Waterloo, looking back over Blundell Sands to the Mersey. 2. Over Rainhill, looking back at Prescott. 3. Leaving Manchester, looking back. 4. Over the Mersey, taken from over the Herculanum Dock. 5. Looking back over the Sloyne and "Lusitania." 6. Looking down the Mersey to the estuary.

Grahame-White School.—On Wednesday, the 9th, the school pilots Hubert and Driver were kept busy with the pupils. Lieut. Dahlbeck, a Swedish naval officer who is almost ready for his tests, flew several circuits on the school Farman, and Mrs. de Beauvoir Stocks, with her instructor, Driver, had a prolonged flight as passenger, taking control of the machine from her seat behind the pilot. A new pupil from the United States, Mr. Raphaite, made his first ascent with Hubert. Lieut. Stopford, R.F.A., took another step forward in his tuition by having rolling practice in charge of the lever, with Driver in the passenger seat to correct his movements, and Lieut. Dodgson, R.H.A., had two circuits as passenger with Hubert. May was doing straight flights. In the early morning on Thursday Driver directed tuition operations, all the pupils being instructed in succession. Grahame-White flew several circuits in the evening, probably to give vent to his overwrought feelings in connection with the trouble he was having in getting his machine shipped at Liverpool. In addition to tuition work, several "booked" passenger flights were given by Hubert and Driver. Friday was windy and work was quiet. Saturday saw all the pupils out as usual. Mrs. Stocks, and Lieuts. Stopford and Dodgson rolling, Mr. Raphaite having passenger flights, and England, Lieut. Dahlbeck, and James May flying circuits. Later on in the evening, Driver took up two passengers consecutively for several laps of the aerodrome.

Flying did not commence on Sunday until well on in the evening. No tuition was undertaken, the flights being of the exhibition order. Hubert really excelled himself at sharp turns and acute banking in the course of a 20 minute flight, while Driver kept grinding round and round the aerodrome giving passenger flights.

Monday's work can be best described as tuition in the early morning and more tuition in the evening, the only feature out of the common being Driver's last flight with a passenger, being undertaken "au clair de la lune."

Valkyrie School.—At 4 a.m. on Thursday last week, Mr. Barber took out the Valkyrie racer, and, preparatory to making a cross-country flight, gave Mr. Ingall, of Eastbourne, a short flight, attaining an altitude of 300 ft. On descending, the wind increased rapidly, and operations had to be suspended for the day. Matters were quiet until Monday last, when the machines were out at 3.30 a.m., the school pilot taking Mr. Newman, of Cambridge, for several circuits. Though the anemometer only registered 10 miles per hour, the air proved to be exceptionally tricky, even at this early hour, the machine dropping bodily 30 ft. and 40 ft. on several occasions, rendering passenger carrying somewhat unpleasant.

Though unable to do any actual flying this week, Mr. Copland Perry, of the Army Air Battalion, was, as usual, very busy in the works, studying the construction and assembling of the machines.

Salisbury Plain.

TUESDAY evening of last week was splendid for flying, and all the dozen pupils at the Bristol School took advantage of it, keeping the four instructors, Messrs. Pizey, Jullerot, Fleming, and Busteed, fully occupied. The officers of the Air Battalion also put in a great deal of practice, Capts. Fulton, Burke and Massy and Lieuts. Conner, Reynolds, and Barrington-Kennett being seen in the air. These military flyers were also out early the following morning, one of the best flights being that of Lieut. Reynolds on the Renault-engined Bristol military biplane. At a height of 2,700 feet he shut off the engine and came down most gracefully in a spiral *vol plané*. Eight of the Bristol pupils were out practising, and during the day they were occupied in erecting work and engine testing in the hangars. The Air Battalion officers were out again in the evening, and Lieut. Reynolds made another pretty flight at 2,000 feet.

Thursday morning was too treacherous for the pupils to get any flying practice, but in the evening there was a brief spell of calm which was eagerly taken full advantage of. Friday was again too blustery for air work, but a good deal of indoor activity was in evidence at the Bristol school, and the same conditions continued until Saturday afternoon, when, in addition to the flights by pupils, M. Prier brought out his racing monoplane which had arrived back on Thursday. Mr. Stanley White and Capt. Dickson were present and witnessed several very satisfactory trials. A good deal of scouting work was also put in during the evening by the Air Battalion.

Sunday morning saw the pupils out early, and at half-past eight Mr. Graham Gilmour arrived *en aeroplane* with a lady passenger from Bristol, followed a few minutes later by Mr. Gordon-England, who had flown over from Brooklands. During Sunday afternoon the Bristol school was hard at work, and at a quarter to seven Mr. Pizey and Mr. Gordon-England started off to fly to Ventnor. An oil pump on Mr. Pizey's machine was in a refractory mood, however, and he came down, as also did Mr. Gordon-England. It was then decided to postpone the flight until Monday morning. The new military machine having been finished, it was brought out for a trial flight by Mr. Hotchkiss, and being satisfactory was handed over to the Air Battalion. Mr. Pitman made his second solo flight, and covered 5 miles at a height of 100 ft. On Monday morning a stiffish breeze was blowing, and after a trial flight Mr. Pizey decided to postpone his start for the Isle of Wight. At six o'clock in the afternoon the conditions were better, and both the machines were got into readiness. Mr. Pizey rose to a height of 1,000 ft., and headed off for Ventnor, while Mr. Gordon-England left Salisbury Plain at a height of 800 ft., following the same direction.

A good deal of practice was also put in by the pupils, several of whom will shortly qualify for their *brevets*. Tuesday morning the wind again confined work to the hangars.

SCHOOL AERO CLUB NOTES.

By ROBERT P. GRIMMER, General Secretary, British Federation of School Aero Clubs.

I HAVE on several occasions had the pleasure of quoting extracts from *La Feuille Sportive*, a French publication devoted to the interests of aviation. The editor, M. F. Gache, is an untiring and zealous advocate of the school aero club movement, and the success that the movement is meeting with in France is largely the result of his strenuous exertions. This is what he says in a recent number of his journal, the article being entitled "Aero-Scholars":—"By degrees they spring up everywhere, developing and forming federations. The time is no more when one laughed at their efforts." In England we have already told what success has rewarded the great struggle, after indefatigable efforts, of the pioneers of the movement. In America the progress is not less remarkable. Here is, indeed, what our contemporary, *The Aero*, of St. Louis, says on this subject:—

"Day by day our schoolboys accustom themselves more and more to the flying machine, day by day also the masters carry on more experiments.

"At St. Louis, at Kinloch, at New York, at Long Island, at Boston, at Squantum, at Waltham, at Chicago, and at Los Angeles are flourishing school aero clubs which instruct the general public by the influence of their pupils. These schools have exercised moreover an excellent influence in stopping the construction of freak machines incapable of flight, like one used to see formerly. They have signalled yet a new improvement. They are teaching how to repair at the same time as to construct. And when the schoolboy, who, having grown up, learns to fly, he is able to do so at little expense, for he repairs his breakages for the most part himself, and thus materially reduces his bills." Our contemporary expresses the hope that there will thus be created a generation of

aviators which may produce another Langley or another Lillenthal. In the same way a German writer who has made a remarkable study of the "Circuit de l'Obenheim" contributes to the *Zeitschrift für Flugtechnik* the following lines:—"Many of these problems might have been solved in preliminary experiments, which, in my opinion, are incumbent upon those who make models. The numerous accidents which have occurred recently are for us a warning against using the full-sized aeroplane for experiments which could equally well have been made with a model."

And now a few words about the Mann monoplane, in reference to which I am inundated with correspondence. As my readers are doubtless aware, I am an ardent champion of this machine, and my advocacy of it has plunged me into a not altogether pleasant controversy in the columns of this paper. The Mann monoplane has been designed with the two-fold end of securing efficiency and automatic stability, and it is hoped later on to apply these principles to a full-sized machine. The winning of contests is a matter of quite secondary importance, the machine was not built for this at all—but incidentally Mr. Mann has received some sixteen awards in the last three years. To design a machine for the advancement of the science, and to make a flying stick, hurled through the air by the thrust of huge propellers driven by a disproportionate amount of rubber are very different things. It seems to me (perhaps I may be wrong after all) that the general interests of aviation form a nobler end than the winning of mere prizes at competitions with overpowered and inefficient machines of the freak category. It has been my experience that almost anything will fly if only enough power is crammed on, but it is that very factor of non-efficiency that is retarding the progress of the full-sized machine.

PROGRESS OF FLIGHT ABOUT THE COUNTRY.

NOTE—Addresses, temporary or permanent, follow in each case the names of the clubs, where communications of our readers can be addressed direct to the Secretary. We would ask Club Secretaries in future to see that the notes regarding their Clubs reach the Editor of FLIGHT, 44, St. Martin's Lane, London, W.C., by first post Tuesday at latest.

Birmingham Aero Club (62, ALBION STREET).

THE headquarters of the club have been transferred to Billesley Farm, Yardley Wood Road, King's Heath. The club extend a very cordial invitation to all interested in aviation in Birmingham and district to pay a visit to the ground any Saturday afternoon. They will be sure to find model flying and glider practice in full swing. The size of the field and the absence of trees mark this ground as a spot for future aviation meetings, or as an alighting spot for aviators coming to the Midlands from the South.

Kite and Model Aeroplane Assoc. (27, VICTORY RD., WIMBLEDON)

THE second annual competition for the Gamage Silver Challenge Cup took place on Saturday, August 12th, in the 100-acre field, Greenford Bridge, and attracted an entry of 33 competitors. The contest was timed to start at 3 o'clock, but, owing to the gusty wind, it was postponed for an hour. At that time 28 out of the 33 competitors faced the clerk of the course, and some splendid flights were seen, the result being Mr. C. B. Ridley first, with a fine flight of 1681 ft. 10½ ins., winning the gold medal and holder of cup for the year; Mr. J. McBirnie second, with 1240 ft., winning silver medal; Mr. A. E. Page, of Allen Knight and Co., third, winning bronze medal, with a flight of 872 ft.; three other competitors flew 850 ft. Messrs. T. O'B. Hubbard and H. W. Browse were the distance judges, the hon. sec., W. H. Akehurst, acting as clerk of the course. The winner's flight was made with his twin-screw monoplane (Ridleyplane No. 60) designed and made by himself throughout, and shows how the schoolboy should be encouraged to build and design models, for from them a great deal can be learnt as regards stability, &c. Two competitions will be held on the same ground on Saturday, August 19th, and anyone wishing to see scientific model flying should pay a visit to Greenford. The first event is for the Association's Silver Challenge Cup and gold medal, and is for longest flight and stability for models rising off the ground. The second being for amateur made models rising off the ground for prizes offered by the well-known model makers, Messrs. T. W. K. Clarke and Co. (of Kingston), Messrs. Bonn and Co. (of New Oxford Street), and the Weston Hurlin Co.

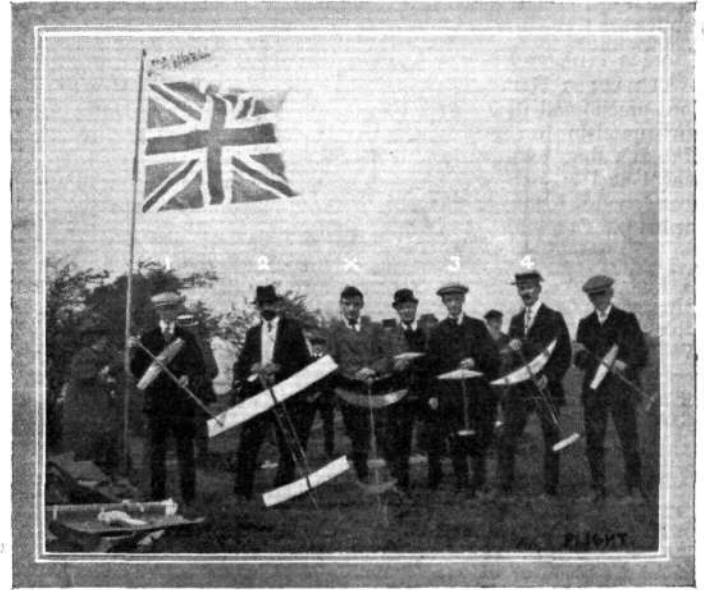
The best way to reach the ground is *via* Perivale Halt Station, G.W.R. Rail motors leave Westbourne Park Station at 1.50 p.m. and 2.15 p.m. The ground will be marked by a kite carrying a banner.

The hon. secretary will be pleased to receive donations towards the prize fund, also to enrol new members. Full particulars will be sent on application.

Sheffield Model Aero Club (35, PENRHYN ROAD).

THE above club held their Bank Holiday model flying competition in the field adjoining Wadsley Church, Hillsborough, Sheffield. There were about eighteen models entered for the

competition, and owing to it being too windy twelve or more of the models were broken up before the start. The results for those who participated were as follows: Longest distance flown, G. Askew, 592 ft.; H. Slack, 334 ft. Duration, Mr. E. E. Noble, of the Birmingham Aero Club, 27 secs.; G. Askew, 18 secs. Height,



SHEFFIELD MODEL AERO CLUB MEETING. — 1. T. Pashley; 2. E. E. Noble (Birmingham Aero Club); 3. G. Askew; 4. H. Slack; 5. A. D. Coakes.

Mr. E. E. Noble. The model flown by Mr. Noble was very neatly made, was a very fast flyer, and showed a good amount of stability.

SCHOOL AERO CLUB.

Arundel House School Ae.C. (15, ARLINGTON ROAD, SURBITON)

ON Friday, the 11th inst., the club secretary, Mr. Robert P. Grimmer, flying the Mann monoplane No. 49, on Wimbledon Common, made an absolutely straight flight of 2,685 ft., thus beating Mr. Mann's recent record by 150 ft., and incidentally establishing a new world's record for distance. A new Mann monoplane, specially designed for flying in very high winds, is in course of construction.

THE BELGIAN NATIONAL CIRCUIT.

IN our last issue we were able to give the progress of this competition up to the arrival of Tyck and D'Hespel at Mons, the end of the second stage, on Tuesday afternoon. Lanser was able to complete the journey on the following day, as also was Contenet. The 9th inst. was spent at Mons, when competitions were held for a number of prizes offered locally. In these Comte d'Hespel was the most successful, although Tyck and Contenet also made some good flights. On the 10th inst. the circuit was resumed, the end of the daily stage being Blankenberghe, but the violent wind made the conditions very difficult, and none of the competitors, in fact, succeeded in getting through. Tyck, D'Hespel, and Contenet left Mons to time, but Lanser, although he started, was unable to get away owing to motor troubles. The three actual starters passed Courtrai, a flying control, in fine style, and all three reached Menin. There Contenet decided to stay, as he was very tired through the buffeting of the wind. Tyck and D'Hespel went on, but the former landed at Paelingburg, while D'Hespel came

down at Furnes, both of them deciding to stop for the night. On the following day D'Hespel arrived at Blankenberghe, but as he had not flown over some of the flying controls, according to the regulations, he was penalised, thus allowing Tyck, who arrived an hour later, to take the first place. No further progress was made during the day, but on Saturday Lanser and Contenet reached Blankenberghe and a number of flights were carried out, Comte D'Hespel going to Ostend and back, while Parisot, who had also got through from Mons, made four circuits of the town, the other aviators present giving several exhibition flights. The fourth stage to Antwerp was started at five o'clock on Sunday morning, but in view of the wind all the competitors with the exception of Tyck decided to wait for better conditions. Tyck suffered for his imprudence as he came down suddenly, breaking one wing, the propeller and the tail of his machine. As there was no sign of the weather improving, it was decided to postpone the start, while as the weather was if anything worse on Monday another postponement was then necessary.

A New American Record.

FLYING over a five-mile circular course from Mineola to Westbury, St. Croix Johnstone on an American built Moisant monoplane set out to better the world's distance record on August 1st. He came down for food after covering 195 miles in 4h. 1m. 53s.—a new American record, and beating Parmelee's figure of 3 hrs. 39 mins.

The U.S.A. Hydro-Aeroplane.

WITH Lieut. T. G. Ellyson and Capt. Paul W. Beck on board, some interesting trials were carried out over Lake Keuka on the 24th ult. with the Curtiss hydro-aeroplane, built for the United States Government. Both on the water and in the air the officers handed the control from one to the other without any difficulty.

BRITISH NOTES OF THE WEEK.

Aeronautic Research Scholarships.

ANNOUNCEMENT is made by the Governors of the Imperial College of Science and Technology that they are prepared to award scholarships to advanced students desirous of undertaking research work in scientific problems connected with aeronautics. The scholarships will consist of exemptions from fees, together with maintenance allowances at rates fixed with regard to the circumstances of the case. In suitable cases provision will be made for part of the work to be undertaken at the National Physical Laboratory, Teddington. Advanced courses of lectures in aeronautics are to be arranged for shortly by the College.

Charles Hubert Flies a Monoplane Again.

CHARLES HUBERT, one of Grahame-White's pilots, who has done much good flying on a Farman biplane, chiefly at Hendon, is now practising on a Blériot monoplane. It will be recalled that Hubert's first experiments were made at Grahame-White's old school at Pau, South of France, on a machine of this type, but he abandoned it in favour of the biplane, on which machine he qualified for his pilot's certificate in February last.

Flying for a Wager.

IN order to win a wager made by his friends, who asserted "he wouldn't dare go up in an aeroplane," M. Francis de Moreau took a long flight with Hubert at the London Aerodrome last Wednesday. Evidently the former's friends were, like many other people, under the impression that flying is an abnormally nerve-racking pursuit. At any rate, he won the money, and we have it on Hubert's authority that he found the process an unusually exhilarating one.

Commercial Activities at Hendon.

A NEW Company, under the style of "The Grahame-White Aviation Co., Ltd.," has been formed to take over the London Aerodrome, and all Mr. Grahame-White's interests and stock of machines. It is understood that this new Company is practically the originally proposed "Grahame-White, Maxim, and Blériot, Ltd.," on a different basis, although the nominal capital of the Company—£200,000—is precisely the same. With Mr. Grahame-White himself as managing director, we naturally look forward to still further

practical developments as soon as the new Company commences operations.

Fisher to Pilot the Vickers Monoplane.

E. U. B. FISHER, who has been engaged by Messrs. Vickers, Ltd., to pilot their new product, is one of the cleverest monoplane pilots that England possesses. He has been an habitu  of Brooklands since the very early days, and while he and his friend Raynham, now of Avro fame, were with Neale, they used to provide considerable amusement to the rest of the community by doing "stunts" on bicycles outside the "Blue Bird" restaurant. Fisher graduated on the Hanriot monoplane during the spring, and he soon developed into a flyer of something approaching the Hubert Latham order. He has since experimented with the Martin-Handasyde and the Flanders monoplanes.

Mr. Piffard's Hydroplane Capsizes.

AFTER making one or two alterations to it, Mr. Piffard had his hydroplane taken down to the sea at Shoreham on the 8th inst. Almost as soon as it was launched, however, it capsized; but this was an emergency for which Mr. Piffard and his assistants were well prepared, as they are all expert swimmers, and they soon had the machine ashore.

Mr. Grahame-White at Southport.

THE second series of aviation displays arranged at Southport, arranged through the good offices of Mr. Leonard Williamson, came to an end on Saturday last, but the result was no more satisfactory than before, for out of thirteen days for which flying had been arranged, it was only possible on four or five, and on nearly all those occasions flying could only be carried out in the evening. On Tuesday afternoon of last week Mr. Grahame-White was at the aerodrome, and although a stiff breeze was blowing he made several circuits of the ground in the "Baby" biplane. A further series of flights were given during the evening, when a large crowd assembled to witness them.

Mr. Radley Flies the Channel.

HAVING secured a new Bl riot machine, Mr. James Radley decided that the most fitting way to bring it over was to fly it across the Channel. He started from Les Baraques, near Calais, on



LONDON FROM ABOVE.—Vauxhall Bridge, as viewed from Consul Stollwerck's Continental balloon, "Flannover."

Saturday afternoon, intending to fly to Shoreham, but after crossing to Dover in 22 mins. he continued along to Folkestone, and came down in a field not far from Shorncliffe Station.

Mr. Morison Falls in the Sea.

ON Monday, Mr. O. C. Morison took his place on his machine with the intention of flying to Shoreham *en route* to Ventnor in the Isle of Wight. The machine had been taken to a field, on the Leas at Folkestone, from where Mr. Morison made a good ascent. The engine, however, was not giving entire satisfaction, and Mr. Morison came down on the sea a short distance from the shore. He escaped with a ducking, while the machine, which was slightly damaged, was towed ashore.

Brooklands to Ventnor on a Deperdussin.

AMONG the arrivals at Ventnor on Tuesday morning was Mr. James Valentine, who had made a satisfactory flight from Brooklands on a Deperdussin machine.

From Salisbury Plain to the Isle of Wight.

IN order to fulfil their engagement to give flying exhibitions during the Ventnor Week, Mr. Pizey and Mr. Gordon-England, both on Bristol biplanes, left Salisbury Plain on Monday evening for the Isle of Wight. After being delayed for a day by bad weather, Mr. Pizey had to land at Cowes owing to engine trouble, but on this being put right started off again, only to proceed about five miles. Then he decided to come down and continue his flight to Ventnor in the morning, which he successfully did. Mr. Gordon-England had to descend in the vicinity of Newport, I.W., for a supply of petrol. He made a fresh start, but had only gone three miles further when he was brought down in a turnip-field by the gusty wind, the machine being somewhat badly damaged, although Mr. Gordon-England did not suffer any serious consequences himself from the sudden descent.

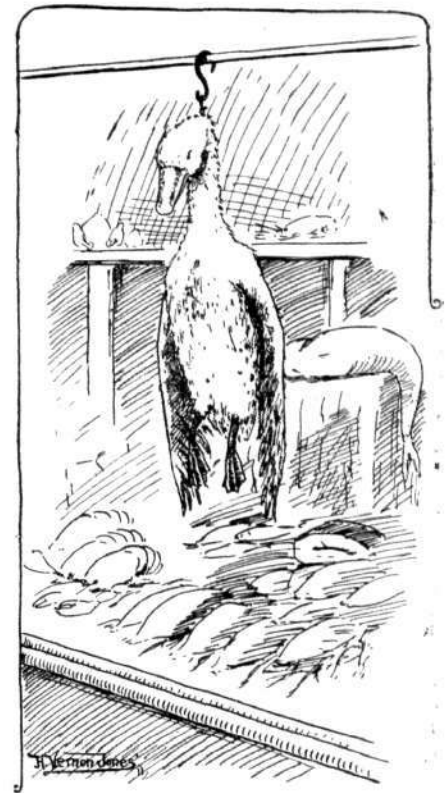
Mr. Cody Assists Territorial Tactics.

WHILE practising on his biplane at Aldershot on Tuesday, Mr. S. F. Cody, by way of demonstrating the importance of aeroplanes in tactics, offered to assist the commander of some Territorial troops who were engaged in a sham fight. The offer was accepted, and about half an hour afterwards Mr. Cody returned from a reconnoitring flight with such detailed information as to enable the officer to conduct a successful attack upon the "enemy."

The Government's "Adequate Protection" to Peaceful Ratepayers.

GRAHAME-WHITE has had considerable trouble with the dock strikers in connection with the dispatch of his "Baby" biplane

to America. His intention was to take it with him on the "Mauretania," which sailed on the 12th, but when the machine arrived at the dock gates on the previous Wednesday afternoon the lurry was surrounded by a crowd of about 2,000 strikers, who demanded the shipping note. This not being forthcoming, the leader of the riot gave orders to cut the ropes and smash the machine up. The police were appealed to, but were powerless against such a force. They pulled the man who was in charge of the machine off the lurry, and after knocking his hat down over his eyes gave him the alternative of making himself and the machine scarce or of being smashed up. He chose the former plan, and under escort of a deputation of strikers he drove to the nearest warehouse. Mr. Grahame-White, as soon as the news arrived, hurried away to Liverpool to attend to matters himself, but being no more successful than his agent had to leave on the "Mauretania" without his machine. Efforts were made to ship the biplane aboard the "Zealand," sailing for Boston on Tuesday, the 15th inst., but up to the time of writing it is not known whether this was accomplished.



Another aviator suspended.

Ae.C.F. PILOT AVIATORS.

Name.	Country.	Date of Birth.	Where Born.	Machine	Qualified.	No.
Berlot, Henri Joachim	Fr.	25 Ju., 90	Lyon	Som.	23 Ma., 11	450
Biaud, Desire Joseph	..	19 Fe., 86	Paris	H. Far.	7 Ap., 11	460
Boissouan, Louis	..	6 Fe., 73	Paris	Nieu.	23 Ma., 11	443
Brindejonc des Moulinais, M. G.	..	8 Fe., 92	Plérin	San. D.	23 Ma., 11	448
Cayla, Pierre A. F.	..	15 Jy., 80	Ancenis	M. Far.	7 Ap., 11	458
Clerc, Paul A. L.	..	28 No., 84	Bordeaux	Bl.	7 Ap., 11	465
Contenet, Henri	..	15 De., 75	Paris	Wr.	23 Ma., 11	447
Cummings, Joseph Arthur	Am.	23 Se., 74	Lockhaven, Pa.	Bl.	3 Ma., 11	442
Delacroix, Maurice	Fr.	25 Ju., 86	Abbeville	Sav.	23 Ma., 11	452
Desschamps de Bois, Herbert G. J. P. S.	..	14 De., 74	St. Maurice d'Etelan	Cau.	7 Ap., 11	461
Desparmet, Jean	..	7 Ju., 90	Lyon	Som.	23 Ma., 11	451
Divetain, Pierre	..	21 Ja., 93	Cherbourg	Goupy	7 Ap., 11	466
Ducourneau, Jean M. R.	..	10 Ja., 77	Hagetmau (Landes)	Bl.	7 Ap., 11	457
Echewan, Paul Maurice	..	28 Ja., 77	Angers	Bl.	7 Ap., 11	466
Gastinger, Edouard Maurice	..	10 Fe., 92	Sarneuemine	Bl.	7 Ap., 11	455
Gautheron, Louis	..	9 Se., 75	Pouilly-sur-Charlieu	Bl.	23 Ma., 11	449
Grandjean, Etienne C. H.	..	16 Ma., 88	Paris	M. Far.	7 Ap., 11	469
Guerre, Henri	..	16 Au., 71	Lyon	Som.	23 Ma., 11	444
Guillemard, Theodore	..	23 Oc., 79	Havre	Nieu.	23 Ma., 11	445
Houpert, Andre J.	Am.	29 My., 85	New York	Bl.	3 Ma., 11	441
Jacquemart, Georges C.	Fr.	6 Au., 92	Aubrines	Cau.	7 Ap., 11	464
Lajous, Francois Alban	..	16 Fe., 64	Artigat	Bl.	7 Ap., 11	463
Larfinty-Tholosan, Marquis Jules	..	26 Ju., 86	Guermantes	M. Far.	7 Ap., 11	468
Martinez, Nicolas Edouard	Mex.	6 De., 79	Galcana, Mex.	H. Far.	7 Ap., 11	462
Montjou, Guy de	Fr.	5 Au., 88	Saumur	Bl.	23 Ma., 11	446
Mousnier, Yvon	..	12 Jy., 88	Sceaux	Cau.	7 Ap., 11	454
Ovington, Earle	Am.	20 De., 79	Chicago	Bl.	3 Ma., 11	440
Pujo, Casimir	Fr.	2 Fe., 80	Orignac	Bl.	7 Ap., 11	467
Ravelli, Giovanni	It.	14 Ja., 87	Brescia	Han.	20 Ma., 11	453
Thieulin, Joseph	Fr.	15 Au., 86	Besancon	Breg.	7 Ap., 11	459

Country.—Am. = United States; Fr. = France; It. = Italy; Mex. = Mexico.

Machine.—Bl. = Blériot; Breg. = Breguet; Cau. = Caudron; Goupy = Goupy; Han. = Hanriot; H. Far. = Henry Farman; M. Far. = Maurice Farman; Nieu. = Nieuport; San. D. = Santos Dumont; Sav. = Savary; Som. = Somner; Wr. = Wright.

VEDRINES' RECORD FOR THE MICHELIN CUP.

ALTHOUGH Vedrines in his attempt for the Michelin Cup on the 9th inst. did not succeed in accomplishing his desire of covering 1,000 kiloms., he nevertheless considerably improved upon Loridan's figures, and so now occupies the first place. The course was from Lhumery (5 kiloms. from Etampes) to Gidy, 8 kiloms. from Orleans, this providing an out-and-home course of 101'4 kiloms., a little more than the 100 kiloms. required under the new rules.

He made a start a few minutes after 4 o'clock in the morning, and continued flying for six hours, only stopping for some twenty minutes in the third round in order to take on more petrol. During the sixth round, however, when he came down for replenishments, he complained greatly of the heat, which caused the atmosphere to be very disturbed. After resting for 50 minutes he got away again, and completing one round, landed for the third time. He again rested for 50 minutes, and on re-starting only went round the course once more, then decided to give up, having covered 811'2 kiloms. in 10h. 56m. 42s., while his official record for the Michelin Cup stood at 800 kiloms. The following table shows his cumulative time for the eight laps, and it may be noted that his average speed was 73'8 k.p.h., or deducting the time of the stops, 93 k.p.h. :—

Laps.	Distance. kiloms.	Time. h. m. s.	Laps.	Distance. kiloms.	Time. h. m. s.
1	101'4	1 4 4½	5	507	5 44 55½
2	202'8	2 8 24½	6	608'4	7 40 48*
3	304'2	3 34 33½	7	709'8	9 37 13*
4	405'6	4 39 26½	8	811'2	10 56 42

* Including stop of 50 minutes.

In the early evening Vedrines flew back on his machine to Issy in order to take part in the welcome home to Frey, with whom he took part in the Paris-Rome race, at the Morane headquarters.

FOREIGN AVIATION NEWS.

Further Trials with the Voisin Hydro-Aeroplane.

CONTINUING the series of trials which have been conducted by Colliex with the Voisin "Canard," adapted for aquatic experiments by the addition of a series of Fabre floats, the machine was flown by Colliex from Issy on the morning of the 10th inst., and came to rest gracefully on the surface of the Seine just by the Voisin works at Billancourt. The pilot was not alone, however, as he had been accompanied by the designer of the machine, Gabriel Voisin, and their arrival at Billancourt was awaited by representatives of the French Army and Navy. After a brief rest the machine rose from the water, and flying over one or two bridges came down again on the Seine at Auteuil. From there it once more ascended, and flying across to Suresnes returned over the river to Billancourt, and once more came down on the river. It was then taken to the shore and wheeled into its shed.

Vedrines as Postman.

ON the 11th inst. Vedrines left Issy with the intention of flying to Trouville with a package of newspapers which had been entrusted to him. He then only reached the Longchamps Racecourse, when he had to come down owing to an adjustment being necessary to his magneto. He, however, successfully made the trip on Sunday, when leaving Issy at 20 minutes past 5 he landed on the Deauville Racecourse at 10 minutes to 7, having circled over Trouville and Deauville before coming down. Besides carrying letters and newspapers to the seaside resort, he also dropped several packages *en route* to Mantes, Evreux, and Lisieux. The flight, which is about 137 miles, and was completed in just about half the time the express train takes, also counts for the Quentin Bauchart prize.

A Flying Inspection.

GENERAL ROQUES is determined to keep himself thoroughly abreast with the developments in aerial navigation, and although he is hardly able to find time to undertake the piloting of a machine himself, he does not hesitate to take passenger flights in the various types. He recently determined to visit the flying grounds in the neighbourhood of Paris, and decided to go from one to the other by aeroplane. His first call was St. Cyr, where, after having a look round, he mounted a Maurice Farman machine behind Capt. Eteve, and was taken to Etampes, the journey occupying about an hour and being carried out to a height of about 500 metres. Captain Marie, orderly officer to General Roques, was also carried over to Etampes by Lieut. Cheutin on a Maurice Farman machine. At Etampes, General Roques accompanied Lieut. Ducourneau on a Blériot two-seater for a trip over the surrounding country, and also to the Henry Farman and Deperdussin schools. He then returned to St. Cyr under the pilotage of Captain Felix on a Blériot machine, and then finished up his journey to Paris by motor car.

Aviators at French Army Manoeuvres.

IN a note issued by the French War Office M. Messing, the Minister for War, points out that since last year's manoeuvres the position with regard to aviation has changed considerably. Then it was necessary to call upon a number of the reserves, such as Breguet, Latham, Paulhan, &c., but now there are more than sufficient officers qualified to supply the need. M. Messing has nevertheless decided to employ a number of reservists, so that they may obtain experience of military operations.

French Navy and Aviation.

ALTHOUGH a number of Naval officers have been trained as pilots, the French Navy has, up to the present, officially paid practically no attention to aeroplanes. This, however, is now to be remedied, and M. Delcasse, the Minister of Marine, has decided to have an aeroplane service organised. Commandant Daveluy is to be appointed to the charge of this new equipment, which will, however, take some time before it is fully established.

Aviation for Convalescents.

AFTER being practically *hors de combat* for a couple of years, owing to a very bad accident, M. Richer, who collaborated with the late Capt. Ferber in many of his experiments, has returned to aviation, and is practising at Crotoy, where, on the 10th inst., he made a good flight over the sea.

At the Blériot School at Etampes.

AMONG the large number of pupils at present training at the Blériot school at Etampes, are several officers of various nationalities, and on the 11th inst. Captain Gorskoff, of the Russian Army, made

the three long tests for his *brevet*, while Lieut. Zorfeilano, of the Roumanian Army, made two of the necessary flights.

From Etampes to Chalons.

IT having been decided to transfer one of the Henry Farman racing machines from Etampes to the headquarters at Chalons, Bille, the chief pilot at the Farman school, resolved to fly it over, a task which he successfully accomplished on the 11th inst.

An Hour on an Antoinette.

AT Mourmelon on the 10th inst. Lieutenant Rochette was flying for an hour on one of the Antoinette machines. Sapper Schlumberger on Saturday last satisfactorily made the first two tests for his superior military certificate on an Antoinette.

More Military Breguet Pilots.

ON Saturday last Lieuts. Gourlez and Migaud carried out the first tests for their military superior certificate, the former covering the 100 kiloms. in 1 hr. 15 mins. The second test was made on the following day, when they flew from Douai to Doullennes and back, the 100 kiloms. again taking an hour and a quarter. On the way the aviators released some carrier pigeons, which returned safely to their home at Douai.

At the Juvisy Goupy School.

TESTING a new military Goupy machine on Saturday last, Ladougue, with a passenger and a four hours' supply of oil and petrol on board, mounted to 340 metres in 9 mins.

At the Rheims Deperdussin School.

QUITE a deal of activity has been witnessed at the Deperdussin school at Betheny during the past week. On the 8th inst. M. Anzani was testing a monoplane fitted with one of his 80-h.p. engines, and attained a speed of 130 kiloms. an hour, while in the evening he was flying for 2 hrs. 20 mins., only landing because of the darkness. There are a number of pupils at the school, including several French and Spanish military officers.

Trial for the Ae.C.F. Grand Prix.

IT will be remembered that when it was decided to make the contest for the Michelin Cup a cross-country one, the Aero Club of France offered their Grand Prix for the longest flight round a closed circuit under the old Michelin Cup conditions. At 10 minutes past 4 on the 8th inst., Fourny on his Farman machine set off to try and win the prize, but after flying till mid-day, and covering 500 kiloms., he was obliged to land suddenly in a field in which haymaking was in progress. The machine was slightly damaged. Incidentally the flight showed that the Maurice Farman machine can easily meet the conditions imposed for the military aeroplane competition of flying 300 kiloms. with 300 kilogs. of useful load. The weight of oil and petrol carried by Fourny's machine was 500 kilogs.

Capt. Felix to Fly Over the Alps.

ALTHOUGH he was successful in handsomely beating the height record the other day, that was not the sole object of Capt. Felix in venturing to such a height. It was more in the nature of a preliminary practice for some flights which he hopes to make shortly through the Alps on his Blériot machine. He is going to Aix-les-Bains, and from there to Chamonix, *via* St. Amand, Lyon, and Grenoble. From Chamonix he intends to carry out a series of flights over some of the high Alpine peaks.

A Long Reconnaissance.

LEAVING Buc on Saturday, Lieut. Grailly on his R.E.P.-engined R.E.P. monoplane, flew over Chantilly and Beauvais, landing finally at Compiègne, where he intends resting for a day or two.

Etampes and Chalons to Nevers.

CAPTAIN ETEVE and Lieut. Cheutin, each on a Maurice Farman biplane and accompanied by a brother officer, flew on the morning of the 10th inst. from Etampes to Montargis, *via* Pithiviers and Beaune la Rolande, the journey taking an hour and ten minutes. At Montargis they were joined by Lieut. Menard, who on a Henry Farman machine had flown over from Chalons Camp, the 210 kiloms. being covered in 2 hrs. 10 mins. On the following day the five officers continued their journey to Nevers, where they arrived safely. On Saturday last they made several flights there, while Kimmerling, Aubrun, and Dailens were also seen in the air.

Reconnoitring on a Breguet.

LIEUT. LUDMANN on his Breguet machine started off on the 8th inst. from Douai on a reconnoitring flight to the Belgian frontier.

During a trip of 400 kiloms. (250 miles) he passed over Hazebrouck, Laon, Bethune and Arras, and only landed twice. He however kept in communication with his headquarters by releasing several carrier pigeons. On the following day Lieut. Ludmann made the third test for his superior military certificate.

A French Military Test.

IN obedience to orders, Lieut. Gouin, on the 2nd inst., left St. Cyr on a Blériot machine, with the intention of carrying out a series of cross-country flights under novel conditions. He was not allowed to be followed by a motor car with spare parts, &c., and his single mechanic was to follow the pre-arranged course by means of the railway. On the 8th inst. he was at Douzy, and the following day went over from there to Douai, covering the 150 kiloms. in an hour and a half. He was away again on the 10th inst. for Vidamee, by Chantilly. Previous to starting from St. Cyr the Blériot had a record of 2,500 miles cross-country work to its credit.

A New Breguet School.

OWING to the large number of pupils seeking to learn to operate the Breguet biplane, M. Breguet has decided to open another school at Villacoublay. This will be under the charge of M. Xavier Martin, and by way of inaugurating it M. Breguet on the 11th inst. made some splendid exhibition flights.

By Way of Revenge!

FREY, who it will be remembered broke his legs in a fall at Ronciglione, near Viterbo, while making a plucky attempt to fly from Rome to Turin, has now returned to France. He still has to have the assistance of a pair of crutches, and as soon as they can be discarded he intends to use a walking stick which has been made from the tree with which his machine collided.

A Bristol at Vichy.

THE Bristol biplane which Versepuy has at Vichy is seeing plenty of service, being out on every fine night. He makes flights over the surrounding country, and finds difficulty in coping with the large demand for passenger flights. On the 10th inst. he took up twelve passengers, including several well-known people.

A Wright Biplane on Lake Lucerne.

A NEW French-built Wright machine fitted with floats is being tried at Lucerne by Maurice Herbster, and on the 8th inst. some very fine flights were made over the surface of the Lake of the "Four Cantons."

German Aerial Volunteers.

IN connection with the German Army manoeuvres which will take place next month, it has been announced that the presence of volunteer aviators will be cordially welcomed, and the Kaiser has expressed a desire that as many German aviators as possible will take part. In addition to the aeroplanes, three of the army airships are to assist in the manoeuvres.

St. Louis to Chicago.

ON Monday morning Mr. Harry Attwood started from St. Louis with the intention of flying to New York *via* Chicago on his Burgess-Wright machine. With two stops on his way to replenish petrol, he succeeded in covering the 200 odd miles in 5 hrs. 43 mins., his time for the first 96 miles from St. Louis to Springfield being 1 hr. 50 mins. He intends to go on to New York and was to have continued his journey on Tuesday afternoon.

Mr. Sopwith at Chicago.

FROM a brief message from Chicago we learn that on Sunday Mr. Sopwith broke an American record by flying for more than an hour with two passengers, winning prizes of the value of £600. On the previous day he finished second in the speed races to Mr. Earle Ovington, the latter covering 20 miles in 23 mins. 51 secs. and 14 miles over water in 17 mins. 13 secs.

Two Fatal Accidents at Chicago.

THE Chicago meeting was unfortunately marred by two fatal accidents on Tuesday last. Wm. Badger fell about 100 feet on a Baldwin biplane and was instantly killed, while St. Croix Johnstone, flying a Moisant monoplane, fell about 3,000 feet into Lake Michigan and was drowned.

An Exciting Adventure.

ALBERT FILEUX, who will be remembered as the mechanic who accompanied the late J. B. Moisant in his flight from Paris to London, had an exciting time while flying at New York the other day. While over the Nassau Boulevard, his engine stopped, and before the pilot could rectify matters the machine had "pancaked" down on to an empty motor car. Fortunately the pilot was unhurt, but the monoplane and motor car each were "the worse for wear."

Mr. Wilbur Wright's Views.

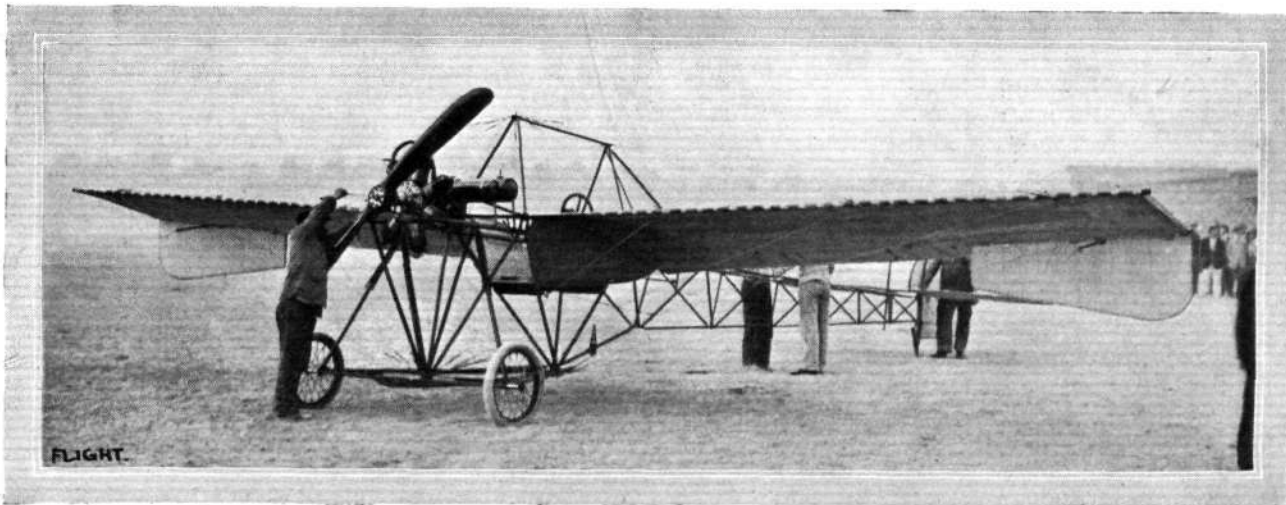
ACCORDING to the interviews with Mr. Wilbur Wright, which have been published in America since his return home, the spirit of commercialism is killing aviation on this side of the Atlantic. Although long flights are being made, Mr. Wilbur Wright complains that it is not so much with the idea of perfecting the flying machine, as of advertising some newspaper or other commercial venture. Possibly, but by report there is a good deal more of that sort of thing going on in America, and without the restrictions tending to reliability which is being imported into the contests this side of the herring pond.

Cattaneo at Buenos Ayres.

IN connection with the *fête* organised by the Argentine Sports Society at Buenos Ayres the splendid flying of Cattaneo was much appreciated. On July 16th he flew over from Palermo to the Mayo Camp, where he was given a great reception by the officers. Later in the day he flew back again to Buenos Ayres.

Long Voyages by "Schwabens."

THE Zeppelin aerial liner "Schwabens," now stationed at Baden Baden, was out for a cruise of a couple of hours on Sunday last carrying 28 persons, 9 constituting the crew and 19 the passengers. On the previous Friday it made a successful trip to Frankfurt and back, making a detour on the outward journey over Homburg and Nauheim.



The latest Bristol monoplane, the preliminary construction of which has been carried out by MM. Voisin Frères. Length, 8 metres; span, 11 metres; surface, 20 sq. metres; steel tubes; 70 h.p. Gnome motor; weight, 400 kilogs.

CORRESPONDENCE.

* * The name and address of the writer (not necessarily for publication) MUST in all cases accompany letters intended for insertion, or containing queries.

Correspondents communicating with regard to letters which they have read in **FLIGHT**, would much facilitate ready reference by quoting the number of each such letter.

Aeroplanes in War.

[1304] With reference to the letter No. 1284, the calculations which Mr. Atkinson requires of me are hardly necessary if he would read through the following.

First the barometer has to be set for the sea level reading, which is to be taken as "normal" for the day; then the aeroplane's position has to be fixed accurately, a difficult matter in hilly country.

Provided that the "normal" barometer reading has not altered (which it may), and assuming there is no instrumental error, the exact position is known, then there will be no error; but since a small error will occur probably in each of these, and an error of the barometer means 100 ft. in height, it is most probable that the height will be at least 100 ft. in error. This will produce an error of anything up to 40 ft. in the bomb-dropper according to the height at which he is flying and speed relative to the ground.

I mentioned an error of 8 ft., as that would occur when the aeroplane was flying out of rifle shot as slowly as can be reasonably expected and against a slight head wind, a circumstance which tends to reduce the error. For the smaller the horizontal velocity of the bomb through the air, the more nearly will it keep that velocity throughout which can be allowed for more accurately.

Also, since for a given error in height the amount by which the shot will miss decreases with the height, there is a certain accuracy in high flying which is modified by the unavoidable instrumental error of the speed-registering apparatus and the personal error of the gunlayer.

So it would seem that a range of about 3,000 ft. would be most suitable for the bomb-dropper as being a good mean working range.

At present gyroscopic gear of any sort is too heavy for an aeroplane, but undoubtedly will be of the utmost use in the near future.

D. H. T.

Monoplane Construction.

[1305] I am shortly going to build a small man-carrying monoplane, and would be glad if your readers would make suggestions on the following points:—

- 1. Would a supporting surface of 162 sq. ft. main planes and



56 sq. ft. tail plane be enough, the span of former being 27 ft., chord 6 ft.? My weight is 122 lbs.

- 2. Should the length of the aeroplane be the same as the span, or shorter?

- 3. Would the curve in the accompanying sketch be too deep; the plane has square ends?

- 4. At what angle should the main planes be fixed to the body?

Salisbury.

D. ALLON PITT.

Aeroplanes and Gusts.

[1306] I have read the, to me, remarkable article by S. L. Walkden, published in your issue of August 5th, and would point out that, when an aeroplane is travelling in a horizontal flight-path, the force of gravity must be of necessity exactly balanced by the upward lift of the planes; it is therefore impossible that a downward acceleration can exist, and consequently the whole of Mr. Walkden's argument and diagram exist only in his imagination.

BELTON T. HAMILTON, M.I.A.E., A.M.I. Mech. E.

Aeroplane Efficiency.

[1307] Can any of your able contributors say whether the present knowledge of aerial locomotion permits of anything approaching an accurate determination of the mechanical efficiency of a given aeroplane? It would appear from the horse power consumed in the propulsion of the simplest of monoplanes that there must be a great waste somewhere. How does this come about?

When it is stated that such and such a propeller has an efficiency of 80 per cent., what is the basis of the determination? I should be greatly obliged to see this matter put clearly by someone who has had actual experience in testing.

Newcastle-on-Tyne.

A. NOEL FERGUSON.

Hollow Spars for Aeroplanes.

[1308] I have been asked to take an interest in the invention of a mechanical device by means of which spars of any length and thickness and of various kinds of wood can be bored accurately through from end to end. The spars can be hollowed out to any of the diameters used for aeroplane work, and if need be tapered to a point. I am satisfied that hollow spars can be quickly and cheaply made by means of this simple invention, but before going further in the matter would like to have the opinion of your readers as to whether there is likely to be a substantial demand for same in the event of the spars being placed on the market.

Edinburgh.

A. J.

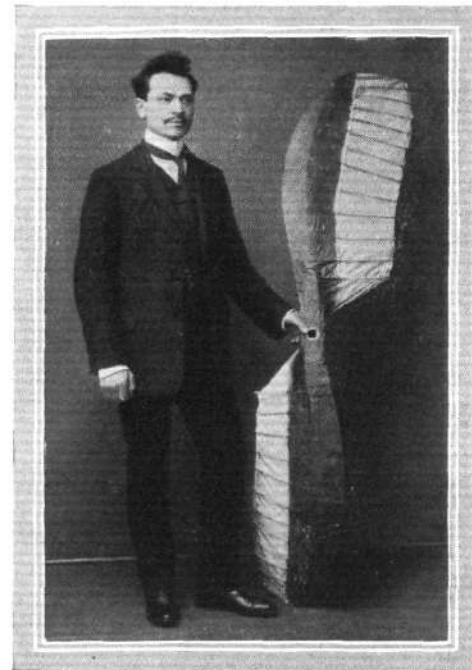
Another Propeller.

[1309] I have always been greatly amused when I have read about people making a new machine with engines of 40-50, even 60-h.p. By using such a power to carry one or two men they prove that their machines are badly constructed, or that they are using bad propellers.

Hundreds of propellers have been designed, but always with the idea that they must be screws. I think it is a mistake.

I have studied birds for years, and I must say that I have found that Nature has given them the "ideal" propellers, which are their wings.

Thinking that it will interest your readers, I am enclosing the



Mr. E. White and his Propeller.

photograph of my propeller, made exactly on the principle of birds wings. It gives twice as much result as the ordinary screws; that is to say, 20 lbs. thrust per h.p.

Of course, my propeller requires great care and study to build, on account of its shape, curves and flexibility; but, on the other hand, it requires only half-size engine for a given thrust, which means less weight, less petrol, less area.

Wimbledon.

E. WHITE.

Vortex Principle of Flight.

[1310] Those of your readers who have followed this correspondence will readily appreciate my position when I say that Mr. Dring's peculiar methods of controversy leave me no option but to make this my last contribution to the discussion.

Mr. Dring has brought forward a theory of insect flight which conflicts absolutely with the exact evidence collected by all the competent authorities who have investigated the subject. The work of scientific investigators such as Marey, Pettigrew, Von Lendenfeld, Bull, Ritter, and others he has thrown aside, without producing tangible evidence against it.

Conversely, the whole of his article and letters will be searched in vain for any scientific proof of the claims he advances for his "vortex propeller," and my reasonable requests that he should place before your readers the above essential proofs he has ignored.

BERTRAM G. COOPER.

Naval Aeroplanes.

[1311] Having regard to the recent successful experiments of the aviator Collioux, with his aeroplane fitted with floaters, which enabled him to alight on and rise from the waters of the Seine, kindly permit me to say that in conversation with naval officers and experts, I find there is a firm opinion that at not very distant date every battleship will be supplied with an aeroplane fitted with floaters, so that the machine can alight alongside the vessel, and be hoisted on board for stowing away.

In view of this I would suggest to the inventor that he should not find it difficult to design floaters which would be collapsible when the machine is in the air or stowed away.

A system of automatic expanders might even be arranged so that on impact with the water the floaters would take their open shape at once.

I am aware there are very few aerodromes where such a machine could be conveniently experimented with, but there is Shoreham, where a river runs alongside the flying grounds.

Pall Mall. J. T. MUSGRAVE.

Fabric Varnish.

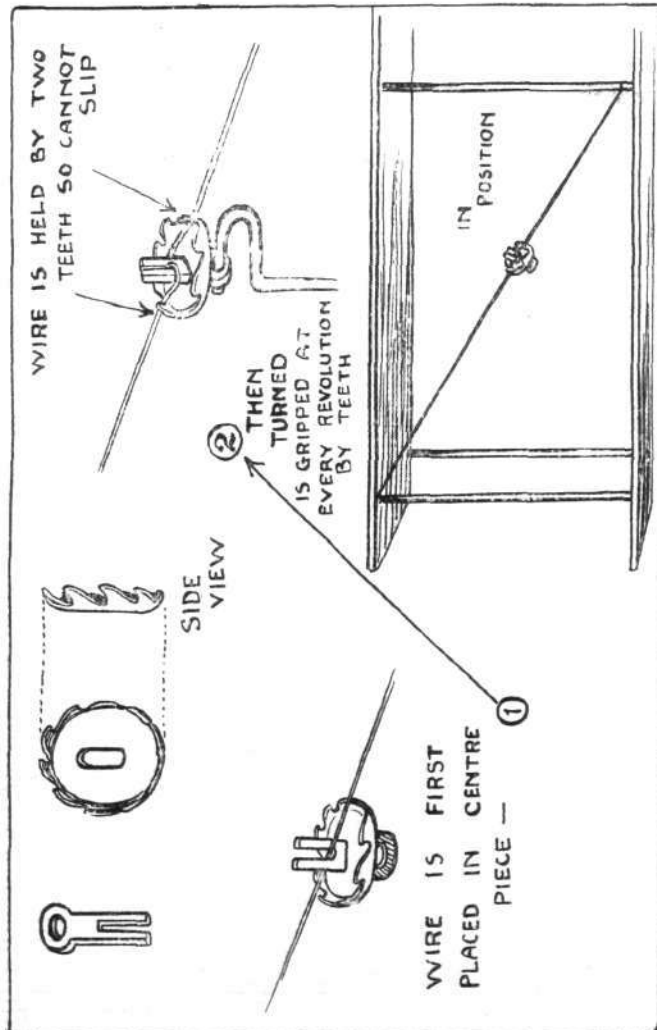
[1312] I read with interest the "Notes on Fabric Varnish" published in FLIGHT last week, and in reply beg to inform your readers that I have invented a varnish which I claim to be absolutely air proof, damp proof, and rot proof. Castor oil having no effect on it whatever, I claim all the qualities embodied in the "Notes" for my varnish. I am further experimenting with an enamel made in various tints which will answer the same purpose. The two will shortly be placed on the market and advertised in FLIGHT, when the arrangements for the manufacture on an extensive scale are completed.

R. DOUGLAS SIMPSON.

MODELS.

New Wire-Strainer.

[1313] I enclose sketches of a new wire-strainer that I have designed for model work. It is composed of two parts, and is made of brass. The overall diameter is about $\frac{1}{4}$ in. As I have found

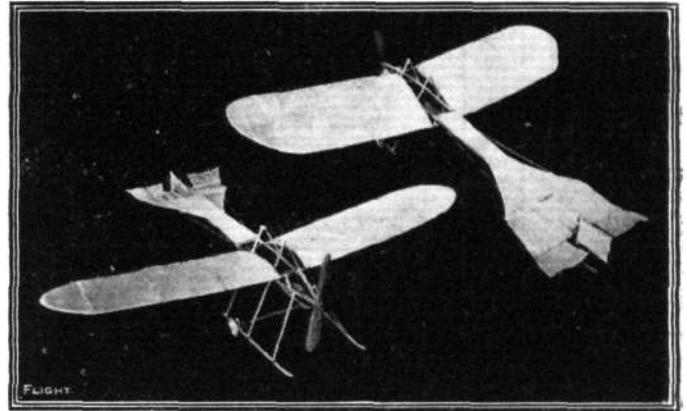


them very satisfactory in practice, I have arranged to place them on the market, and they can now be obtained through any of the dealers at 1s. 6d. per dozen. One advantage of this strainer is that it can be applied without cutting the wire after the wire is in place. It is self-locking, and is tightened by a key.

Balham. H. M. McNEILL.

Model Construction.

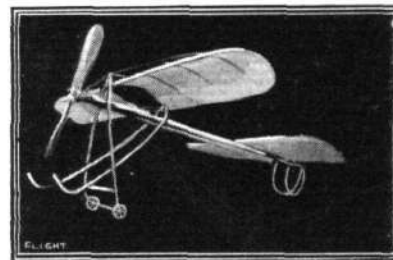
[1314] The two photographs herewith show a model Hanriot that I built from scale drawings in FLIGHT. The planes and tail



are covered with silk and the machine can be dismantled in a few minutes.

Hammersmith. H. T. EYLES.

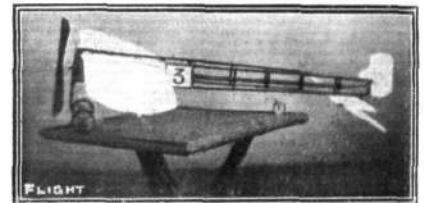
[1315] I send you a photograph of a model monoplane that I have constructed out of cane with no other tools than a penknife. It measures 32 ins. in span and 30 ins. overall. The tail plane is 20 ins. by 7 ins., propeller 12 ins. diameter, elastic 16 yards $\frac{1}{16}$ in. square. Longest flight about 100 feet.



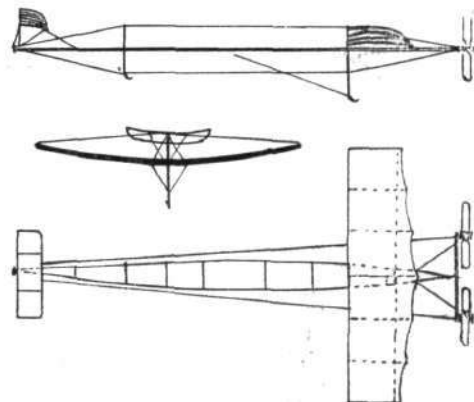
Carnforth. A. PETRIE.

[1316] The accompanying photograph of a model Blériot shows a machine I made from one of E. W. Twining's scale drawings. It took five days to build and flew successfully after the third trial. It rises from the ground after running about 13 ft.

Manchester. C. HEMM.



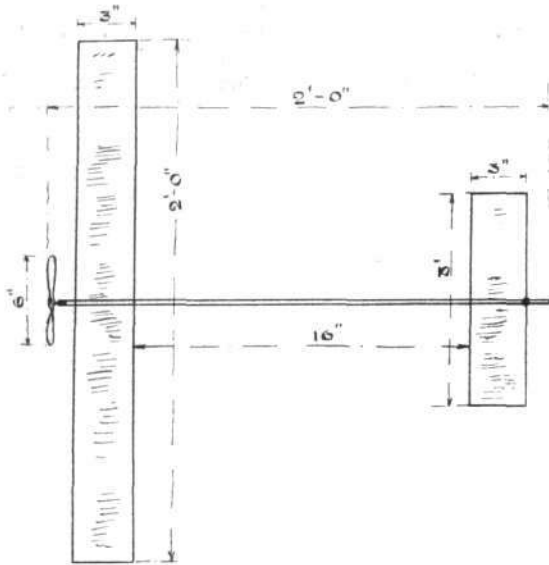
[1317] I enclose drawings of a monoplane with which I have had a flight lasting for one minute. The length of the model is 4 ft. 6 ins. and the span 30 ins. The elevator span is 11 ins. and



the two propellers are 9 ins. in diameter. Twelve strands of $\frac{1}{8}$ in. rubber comprise the motor. With lubricant I can easily get 1,000 turns. The weight of the model complete is 6 ozs.

South Hampstead. M. CANNING.

[1318] This little model cost only 1s. to build. The planes have birch spars $\frac{1}{4}$ by $\frac{1}{8}$ and are surfaced with tissue paper. The elevator



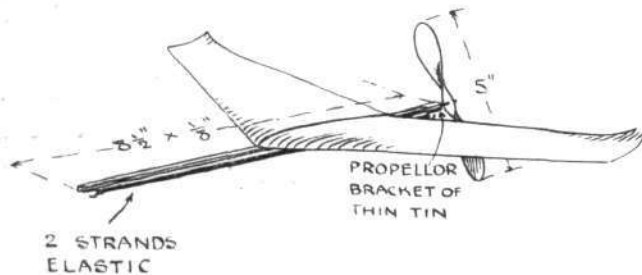
is a piece of wood wafer. The machine flies tail first and will cover over 100 ft. if carefully launched by hand.

Dover.

E. N. JOYCE.

Paper Models.

[1319] After experimenting for some time with paper gliders, I endeavoured to make a larger model and ultimately attempted to



apply power, with some success. I enclose a sketch of a satisfactory design and append the following note:—

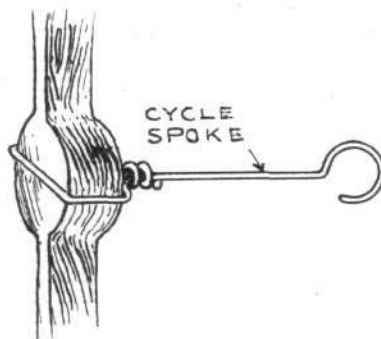
The model complete weighs $\frac{1}{4}$ oz. Wood propeller $\frac{1}{8}$ in. thick, steamed to shape. Hairpin propeller-shaft. Motive power two strands of elastic. Wings made of drawing paper.

D. URQUHART.
Dundee.

Propeller Mounting.

[1320] Replying to letter 1098. A 10 in. propeller should be used and 20 strands of $\frac{1}{16}$ in. elastic. Mount the propeller as shown in the sketch.

B. S. HIRST.
Oldham.



Model Hydro-Aeroplane.

[1321] The first successful flight of a model hydro-aeroplane was made on July 18th, 1911, from one of the Central Park Lakes in New York by Mr. Francis Lee Herreshoff and Dr. Carleton Dederer.

The model is about 30 ins. long, has two surfaces, two motor sticks and rubbers, two propellers, and it floats on three wooden boats which are attached by upright sticks.

The model was wound up, placed on the water, and let go. It advanced on the water for 4 ft. and then left the water. It sustained itself in flight until it reached a height of 15 or 20 ft., at which

height it remained while flying in large circles over the land until the power gave out. The distance of the seven flights which it made was estimated by us to average between 200 and 300 ft., though the exact distance was not of primal interest to us.

New York City.

C. DEDERER, M.D.

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March ...	7,516	11,327	128	1,027	600	357
April ...	6,305	2,110	950	807	1,470	4,343
May ...	846	1,707	400	2,471	350	1,972
June ...	7,961	3,225	642	2,432	558	1,682
July ...	11,608	9,822	336	2,256	830	643
	37,189	32,516	6,156	11,867	4,358	8,997

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Aeronautical Patents Published.

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- 17,463. J. HARGER. Balloon envelopes, &c., to prevent diffusion of gases.
- 17,634. N. N. H. VERNHAM. Aeroplanes.
- 28,907. S. WALKER. Aeroplanes, &c.

Applied for in 1911.

Published August 17th, 1911.

- 10,703. J. R. PORTER. Airships.

PRINCIPAL CONTENTS.

	PAGE
Leader—A Study of Bird Flight	712
The Deperdussin Monoplane (with scale drawings)	713
A Study of Bird Flight. By Dr. E. H. Hankin	716
The Uses of Aeroplanes in Australia	719
From the British Flying Grounds	720
School Aero Club Notes	722
Progress of Flight About the Country	723
British Notes of the Week	724
Ae.C.F. Pilot Aviators	725
Vedrine's Record for the Michelin Cup	725
Foreign Aviation News	726
Correspondence	728

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